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Even Better '60 May Follow Prosperous '59

* * *

Inside Dope

By GEORGE F. TAUBENECK

Learn to live and laugh — thus delay your epitaph

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Frank and Jack, They Aren't Alack
Out of Our Mailbag

Stories of the Week

Fellow in West Virginia wanted to join a Presbyterian Church, but the sprinkling routine wasn't for him. If he were to be baptized he wanted the whole bit.

Immersion wasn't in the Presbyterian minister's repertoire, however, so he sent the fellow 'round the mountain to a Baptist preacher.

The latter was indignant.

"You tell that Presbyterian," he shouted, "that I don't take in other folkses washin'!"

Three hundred pound William Howard Taft underwent an operation during his term as President. His recuperation progressed so rapidly that 10 days later he rode horseback up a mountain trail.

Proudly, President Taft telegraphed news of this feat to his Secretary of State, Elihu Root. Wired back Root:

"Did the horse recover?"

Sterling Prognostications From the Ouija Board

Not everything is on the bright side for 1960. However, our industry does have a great many good things going for it.

To sum up quickly:

(1) Air conditioning achieved a major "break through" last summer. And it's quite possible that 1960 will mark the long-awaited Take-off Point.

(2) Never before has the heating business been so well organized, so promotion-minded, or so progressive as it is today.

(3) Food refrigeration is on the upgrade—more mouths to feed, higher consumption of perishable foodstuffs, proliferation of shopping centers, more advanced equipment.

These are the plus factors. (We shall return to them in a moment.)

What Are the Worries?

Pessimists point out:

(1) The steel strike may resume.

(2) A railroad strike and other labor troubles may be in the offing.

(3) Construction of new homes and industrial buildings

(Concluded on Page 10, Col. 1)

ARI Sees '60 Breaking All Sales Records

WASHINGTON, D. C.—The air conditioning and refrigeration industry has had the best year in its relatively short history in 1959, and 1960 promises to break all records for the sale of all types and sizes of equipment using the "mechanical refrigeration" cycle, so states Geo. S. Jones, Jr., managing director, Air-Conditioning & Refrigeration Institute.

"At the 11th Exposition of the Industry in November," said Jones, "the almost-200 exhibitors were virtually unanimous in expressing the belief that the comeback made by the industry in 1959, after two years when the sales curve was considerably flatter than in the preceding decade, presages a record-breaking 1960 and continued progress through the '60's.

"While all the figures for 1959

(Concluded on Page 21, Col. 3)

* * *

Barring Steel Strike, CRMA Sees '60 Rise

CHICAGO—After examining the industry's sales prospects for the coming year on the basis of present indications and its performance thus far in 1959, the members attending Commercial Refrigerator Manufacturers Association's annual review and forecast meeting here concluded that, barring a protracted steel shutdown or other serious upset, combined volume in 1960 should at least equal or even exceed the record-breaking figure anticipated for 1959. Some felt that the plus margin might go as high as 5 or 6%.

It was reported that industry

(Concluded on Back Page, Col. 1)

Carrier Revises Warranty Policy On Packages

SYRACUSE, N. Y.—In a move "to improve dealer service to customers," Carrier Corp. has revised its five-year warranty on packaged air conditioning and heat pumps.

The new plan, covering equipment of 2 to 30 tons of capacity, took effect Jan. 1.

The first year warranty policy remains unchanged. But, during the second through fifth years, the warranty will apply to the motor-compressor unit only. During these years, a freight allowance both ways from the factory will be provided, and the

(Concluded on Page 4, Col. 4)

Kelvinator To End Annual Model Changes

CHICAGO, Jan. 3—Kelvinator no longer will introduce new models on an annual basis. "The basis for product change will be genuine product improvement, rather than calendar dates," declared Vice President B. A. Chapman at a press conference here today.

"Significant product developments, whether in existing or entirely new models, will be introduced as soon as they are

(Concluded on Back Page, Col. 5)

Review and Forecast

This issue might well be called the "Review and Forecast" edition of the NEWS, since it reviews the sales progress recorded in various segments of the air conditioning, heating, and refrigeration fields during 1959, and also offers some forecasts on 1960 sales probabilities.

In addition to the sales estimates and forecasts made by editors of the NEWS, this issue carries predictions for 1960 made by association officials or executives of individual companies.

Strikes, Like Wars, Are Senseless; Why Can't We Have Labor Courts?

NOBODY wins a strike any more, just like nobody wins a war. Everybody loses—the embattled contestants, the general public, and especially innocent bystanders.

In the case of a protracted strike (as in the 1959 steel situation) union members lose wages they never can recover. Management loses profits it can't make up—and customers are damaged, too.

Inasmuch as unions nearly always come away from the bargaining table with a bigger "package," inflation is abetted. This undermines everyone, especially the general public.

That steel strike really hurt vast numbers of innocent bystanders—merchants, manufacturers of products fashioned

(Concluded on Page 12, Column 1)

* * *

1960 May Set Sales Records for Almost Every Kind of Product

"THE YEAR 1959 COULD BE THE 'TURNING POINT' IN THE SALES PICTURE FOR THE AIR CONDITIONING, HEATING, AND REFRIGERATION INDUSTRY," the NEWS predicted in its "review and forecast" issue just a year ago.

The year 1959, in terms of industry sales, was that and more. In many categories of equipment, sales approached all-time highs, following two somewhat disappointing years. Now there seems to be every reason to believe that 1960 will see sales performances exceeding those of 1959 and perhaps establishing records for almost every kind of product that the industry sells.

A continued general high level of business activity which will mean greater purchasing power, plus a growing acceptance of the industry's products, particularly the benefits of year-round air conditioning, should keep 1960 sales at a high level. Gains made in 1960 over 1959 may not be as great as those made in 1959 over the previous year. However, any improvement made in 1960 over last year will mean that the industry will be having a very fine sales year.

The following is a summary of what 1960 can look like saleswise (more detailed forecasts by various industry authorities are published elsewhere in the issue):

COOLING VOLUME May Rise 20%—Be Tremendous

At the start of 1959, air conditioning industry sales executives were "hoping" that sales increases of 20 to 25% might be possible. In many categories of products actual gains were more like 40 to 50%. It must be remembered that these were gains registered over not-so-high totals in 1958. Thus, if the industry can realize an over-all gain of 20% in 1960 over the high volume realized in 1959, 1960 would be a tremendous year.

RESIDENTIAL: Sales of year-round residential air conditioning systems may have surpassed the 200,000 mark in 1959 for the first time. A slowdown in housing starts might hold back a big jump in 1960, but the greater percentage of jobs are now going into existing homes. An increase of 25% would seem to be a conservative estimate.

ROOM AIR CONDITIONERS: For the "air conditioning year" ending Aug. 31, retail sales were estimated at 1,650,000 units, with about 150,000 to 200,000 units in manufacturers' stocks. Since Sept. 1, in a rush to beat the application of the 10% excise tax to all units, 400,000 or more units have moved into the hands of distributions and dealers. Manufacturers inventories as of Dec. 2 were said to be not more than 35,000 units (in line with a prediction the NEWS made some weeks ago). Thus, field sales factors go into 1960 in good shape, with a price-advantage story to lure early buyers. If the metropolitan markets have some hot weather early, the sales total might jump 20%, sending the total past the 2 million mark.

COMMERCIAL COOLING Replacements May Aid Rise

COMMERCIAL: This category once meant strictly the vertical-style package "store" air conditioner unit, usually water cooled. Now, split-system air-cooled units installed in commercial applications must be considered in the totals. It is estimated that 110,000 packages of all types were installed for commercial use in 1959. A replacement market is beginning to show up, but

(Concluded on Page 21, Column 1)

ASHRAE Finalizes Dallas Meeting Program

DALLAS—Finalized program for its semiannual meeting here has been released by the American Society of Heating, Refrigerating & Air-Conditioning Engineers.

The meeting will be staged Feb. 1 through 4 in the Baker and Adolphus hotels.

At the same time, only four blocks away, the Second Southwest Heating and Air Conditioning Exposition will be presented in Memorial Auditorium.

With its more than 200 exhibitors from 28 states, the exposition is taking on the aspects of a national, rather than a regional show. Emphasis and flavor will be western, however.

The exposition, sponsored by ASHRAE, will be open from noon to 10 p.m. daily from Monday through Thursday. Convention registration will admit one to the exposition.

The ASHRAE meeting, second for the consolidated society, will consist of eight sessions, an afternoon of forums, and a series of committee meetings. All sessions, except the forums, will be held in the mornings so as not to conflict with the exposion.

Four of the sessions will be technical and will be staged in the Baker hotel. Seventeen papers are scheduled to be read in the four days.

The other four will be symposia conducted in the Adolphus hotel. In order, they will cover use of plastics in domestic refrigerators, air conditioning engineering responsibilities, the psychrometric chart, and the role of fenestration in air conditioning.

The six forums slated for Tuesday afternoon at the Baker, will cover automotive air conditioning, frozen food problems, industrial ventilation, practical size limitation of air-cooled

(Concluded on Page 11, Col. 1)

Chattanooga Sales

CHATTANOOGA, Tenn.—The local Electric League reported recently that Chattanoogans, in the first nine months of 1959, bought 7,602 air conditioners for residential use, 90 of which were central units.

This represents a 13% increase over 1958 sales and is the largest number of units ever sold in Chattanooga during a nine-month period, according to the report.

Fedders First '60 Quarter Tops First Half of 1959—Tax Cited

MASPETH, N. Y.—Sales and earnings of Fedders Corp. for the three months ended Nov. 30, 1959, first quarter of the 1960 fiscal year, "not only were very substantially above the levels of a year earlier, but also exceeded those for the entire first six months of the 1959 fiscal year," Salvatore Giordano, president, said at the annual meeting of stockholders.

Giordano told stockholders that "our operations for the November 30th quarter were affected to a very considerable degree by the exceptionally heavy orders placed for the earlier-than-usual delivery of room air conditioners by our Fedders distributors. This created an abnormal situation that resulted in a marked shift from the normal pattern of demand.

"We believe that the great preponderance of this increase in orders was in anticipation of the imposition of a 10% manufacturer's excise tax on all room units under a revised Internal Revenue Service Regulation, effective Dec. 1, 1959."

Net sales of Fedders for the quarter ended Nov. 30 amounted to $26,199,743, as against $10,505,076 for the first quarter of the previous year.

"This," Giordano told stockholders, "represented a gain of roughly $15,700,000 over the last year's first quarter and exceeded sales for the whole fiscal 1959 first half by approximately $2,900,000."

Net income was $1,932,185, equal to $1.01 per share on the 1,907,352 shares of common stock, which represent the average number outstanding during the quarter. This compares with fiscal 1959 first quarter net earnings of $428,731, or 23 cents per share on the 1,829,188 average shares of common stock then outstanding, after preferred dividends. (During the past year all preferred stock was retired.)

Ranco Offers NEW COMMERCIAL CONTROLS for you to specify...

New Double Pole "O" Type Switches

Have wide product application for commercial refrigeration and air conditioning equipment

New double pole, single throw "O" Type Commercial Controls by Ranco are designed for a variety of two pole switching jobs—provide a double break for single-phase operations, simultaneous switching of two circuits, or switching two lines of a three-phase circuit. Available in Single Unit Models for low pressure, high pressure and temperature; and in Dual Models for dual pressure or dual temperature. Controls handle one, two and three-phase motors of ½ through 5 hp.capacity. Safety (High) limit stop may be added to the range screw on the high pressure side of a Dual Pressure Control, or to a Single Unit Control that cuts out on rise in pressure or temperature. Contact your local Ranco wholesaler —or Ranco Incorporated, Columbus 1, Ohio, for more details.

020 SINGLE UNIT CONTROL (Above)
Standard switch action. Contacts open on decrease in pressure or temperature.

021 SINGLE UNIT CONTROL (Not Shown)
Reverse switch action. Contacts open on increase in pressure or temperature.

Manual reset is available on both 020 and 021 Single Unit Controls.

022 DUAL UNIT CONTROL (At Left)
Combines high pressure with either low pressure or temperature. Both sides operate automatically—or manual reset may be added to either high pressure side only, or to both low and high pressure sides.

To Servicemen: Procure Ranco Service Manual No. 1660 from your Ranco wholesaler. It lists "O" Series Controls; covers nearly 5,000 other Ranco replacement applications. *(Not available from the factory.)*

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American-Standard Cooling Div. Names Rossell, Berkshire

NEW YORK CITY—Appointments of H. E. Rossell, Jr. as general sales manager, and R. J. Berkshire as general marketing manager have been announced by C. H. Wilkinson, president of the Air Conditioning Div. of American-Standard.

H. Rossell, Jr.

R. J. Berkshire

"Increased emphasis on the local marketing requirements of our customers," said Wilkinson, "has dictated the creation of these new staff positions."

Berkshire will be in charge of the division's marketing plans and services, market research, product development, advertising and sales promotion, and the division's expanded training school for distributors and dealers.

He has been with American-Standard Air Conditioning Div. since its formation in 1953, and has served most recently as manager of distributor development.

Rossell, as general sales manager, will be in charge of all field sales activities. He was sales manager of the Air Conditioning Div. for the past five years, and has been with the division since its formation.

W. H. Baker, Jr., former vice president, marketing, American-Standard Air Conditioning Div. has joined American-Standard Plumbing & Heating Div.

NAHB Convention Set for Jan 17-21; Many Cooling, Heating Firms To Exhibit

CHICAGO — National Association of Home Builders will hold its 16th annual convention and exposition here Jan. 17 to 21.

As in the past, the convention and exposition will be spread between the Conrad Hilton and Sherman hotels and the Coliseum.

Among the 450 manufacturers displaying their wares for the builders, 39 are producers of heating and air conditioning equipment and 19 others are manufacturers associated with this field.

None of the convention sessions appear to offer any special presentations on air conditioning and heating. Money, merchandising, and new materials will be the primary occupation of convention speakers.

More than 35,000 representatives of the building industry are expected to attend this year's show.

List of exhibitors of air conditioning and heating or allied equipment appears below, with their booth numbers. Booths 1 through 385 are located in the Conrad Hilton hotel, booths 401 through 594 in the Sherman hotel, and booths 701 through 990 in the Coliseum.

Partial List of Exhibitors

Company	Booth No.
Aluminum Co. of America	CH 342-43
American Brass Co.	CH 145-46
American Furnace Co.	COL 855-56
American-Standard:	
Air Conditioning Div.	CH 139-41
Plumbing & Heating Div.	CH 133-38
Arkla Air Conditioning Corp.	COL 752-53
Armstrong Cork Co.	CH 23-25
Baldwin-Ehret-Hill, Inc.	SH 589
Barber-Colman Co.	CH 181
Berns Air King Corp.	CH 350-51
Borg-Warner Corp.	COL 712-717, 728-33
Bryant Mfg. Co.	CH 109-11
Carrier Corp.	SH 401-03
Chicago Pump Co.	COL 860
Chrysler Corp.,	
Airtemp Div.	COL 841-42
Coleman Co., Inc.	CH 40-44
Coolerator Div.,	
McGraw-Edison Co.	COL 935-36
Delco Appliance Div.,	
General Motors Corp.	CH 171-72
Delco Products Div.,	
General Motors Corp.	COL 889
Dow Chemical Co.	CH-372-73
Edwards Engineering Corp.	COL 758
Electromode, Div. of Commercial Controls Corp.	SH 459-60
Fasco Industries, IInc.	SH 453-54
Frigidaire Div., General Motors Corp.	CH 183-90, 193-200
General Electric Co.	
Air Conditioning Div.	CH 47-49
Appliance Div.	CH 50-55
Heil-Quaker Corp.	COL 937
Holly-General Co., Div. of Siegler Corp.	CH 209-10
Hotpoint	CH 88-91
Hunter Div.,	
Robbins & Myers, Inc.	SH 449
Hydrotherm, Inc.	CH 341
International Oil Burner Co.	CH 150-51
International Register Co.	CH 361
Iron Fireman Mfg. Co.	SH 557
Johns-Manville Sales Corp.	CH 86-87, 100-01
Kelvinator Div.,	
American Motors Corp.	CH 1
Kewanee Mfg. Co.	CH 310
Lau Blower Co.	COL 734-35
Lennox Industries, Inc.	CH 211-214
McQuay, Inc.	COL 906
Majestic Co., Inc.	SH 405, 436
Morrison Steel Products, Inc.	COL 884
Mueller Climatrol, Div. of Worthington Corp.	CH 113-115
C. A. Olsen Mfg. Co. (Henry Furnace Co.)	COL 756-757, 776-77

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Dunham-Bush Names John L. Roth

WEST HARTFORD, Conn.— Appointment of John L. Roth as product manager, air conditioning, has been announced by James A. Mulcahey, vice president in charge of sales for Dunham-Bush, Inc.

J. L. Roth

Roth was formerly sales manager of associate sales for York Corp. and earlier was with G-E.

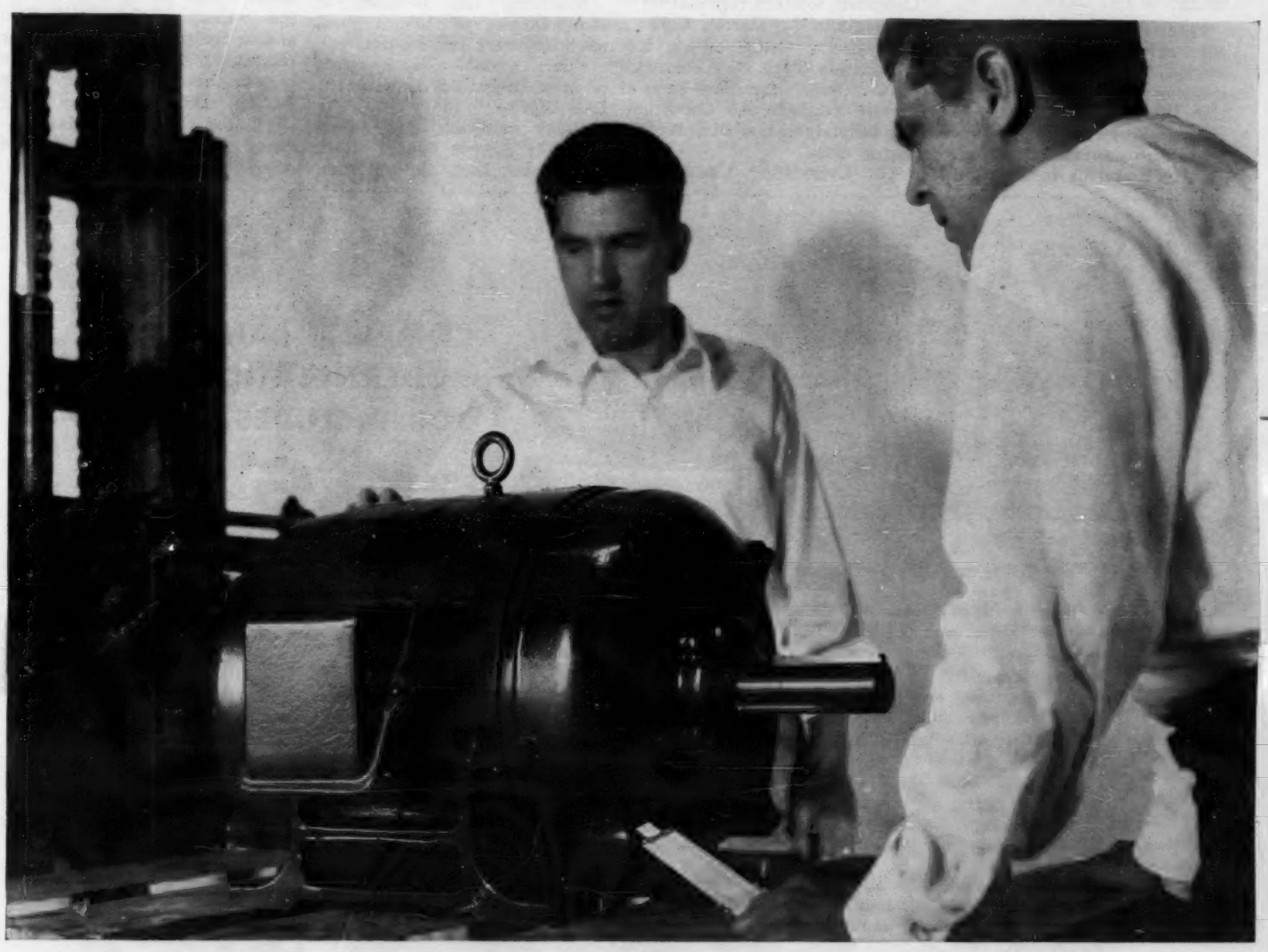
Climate Control To Be Parley Topic

NEW YORK CITY—Climate control, representing electric heating, air conditioning, and humidification in the home, will be featured at the Fourth Live Better Electrically Women's Conference to be held Jan. 7-9, in the Edgewater Beach hotel, Chicago, according to Judith O'Flaherty, chairman, Home Service Committee, Edison Electric Institute.

Some 300 representatives from electric utilities and manufacturers, newspapers and magazines, universities, farm, radio and TV association, and Federal Extension Service are expected to attend.

In the talks on climate control, Dr. J. F. Downie Smith, vice president for research and development, Carrier Corp., will speak on heating and cooling, while J. H. K. Shannahan, vice president, American Electric Power Service Corp. and chairman of EEI's Heating Committee, will discuss space heating.

The three-day meeting will also devote attention to several other subjects.



New Century Electric motor starts on 50% less current

Here is the answer to power company limits on starting current for *single phase* motors . . . a new Century Electric capacitor-start motor with a really low starting current. In the 20 hp size the *starting* current is 220 amps . . . as low as that for a normal 10 hp motor.

Solve many problems—Because of the high cost of running three phase power to many areas, most utilities prefer to supply single phase power. Now heavier equipment can be started on single phase power. This new motor provides enough horsepower to start and operate equipment like . . . large irrigation pumps, crop and hay dryers and hammermills on an open clutch.

Reliable operation—Insulation is bonded "Mylar" and varnish . . . gives tough mechanical protection, high dielectric strength and resistance to moisture. Motor is smooth and quiet running because of carefully balanced rotor. Rotor laminations are skewed for quiet operation. High pressure aluminum casting gives rotor winding bars high density.

Capacitor box comes in separate weather-protected enclosure . . . means it can be mounted conveniently next to control device or wherever space can be best utilized.

Variety of enclosures—The new Century Electric CPF motor is available in totally-enclosed and dripproof enclosures. Sizes range from 7½ to 20 hp . . . speeds 1200 and 1800 rpm.

For more information contact your nearest Century Electric Sales Office or Authorized Distributor. For detailed information on motor applications write for the new Century Electric Motor Application Guide . . . bulletin 270A. For *more* than a motor . . .

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Hess, Westcott Head Speakers Slate At 'Cal-Poly Work Shop' Jan. 22-23

LOS ANGELES — Arthur J. Hess, president of the American Society of Heating, Refrigerating & Air-Conditioning Engineers, and Ralph M. Westcott, president of the national Consulting Engineers' Council, are on the program for the second annual "Cal-Poly Work Shop."

The event will be held in the AC&R Engineering building on the San Luis Obispo campus of California State Polytechnic college Friday and Saturday, Jan. 22-23.

Peter H. Askew, refrigeration wholesaler of Los Angeles, and work shop chairman for the sponsoring California Association, Refrigeration Service Engineers Society, has announced these subjects and speakers:

"Air Problems in Air Conditioning," Arthur J. Hess of Los Angeles, president of Hess, Greiner & Polland.

"Water Treatment Debunked," Ralph M. Westcott of Los Angeles, president of the consulting engineering firm of Holladay & Westcott.

"Modern Test Instruments for Checking Hermetic Compressors," E. C. Williams of Pittsburgh, president of Airserco Mfg. Co.

"Piping Correctly," Cole Campbell, western regional service engineer for Carrier Corp.

"Capacity Reduction on Reciprocating Type Compressors," E. C. "Gene" Hamilton, general service manager, Air Conditioning & Refrigeration Div., Worthington Corp.

"Is Everything Under Control?" E. M. Ford, district manager, Penn Controls, Inc.

"Gas and Oil Contamination in Refrigeration Systems," Wallace Smith, technical serviceman for General Chemical Div., Allied Chemical Corp.

"Vacuum Dehydration of Refrigeration Systems," E. C. Williams of Airserco.

There will be an interval each morning from 10 to 11 o'clock, and again each afternoon for at least a half hour, for "coffee breaks."

During these times, demonstrations will be held in the AC&R engineering laboratories and patio areas of the building. Subjects will be:

Soldering and Brazing, by Paul Domke of Long Beach, manufacturers representative.

Pump cavitation, by Sy Otterholm of Richard S. Dawson Co., Los Angeles.

Relay selection and substitutes, by Ernest Younis of Air Cold Sales, Inc., air conditioning, heating, and refrigeration wholesaler of Los Angeles.

Controls, by E. M. Ford of Penn Controls.

Testing hermetics, by E. C. Williams of Airserco.

The work shop is open to the refrigeration trade. Registration fee of $5 is for all sessions.

Carrier Warranty--

(Concluded from Page 1, Col. 3)

labor allowance will be discontinued.

Vice President Russell Gray, general manager of the Unitary Equipment Div., said: "We believe this revision will end the widespread dissatisfaction among dealers with the five-year warranty. At the same time, we believe that it will protect the buying public."

The old type of five-year warranty on packaged equipment offered a labor allowance schedule set and paid by the manufacturer, it was pointed out.

"Because of these fixed charges, dealers in most sections of the country have been unable to realize any earnings on labor expended in installing parts," the announcement said.

"By setting his own fee for motor-compressor installation, the dealer will have more incentive to divert precious manpower to this type of work during the busy seasons.

"The dealer will continue to offer a warranty for one year on both labor and parts. During the succeeding four years, the buyer will be protected against the purchase of a replacement motor-compressor, which is the major item of expense he might incur."

Equipment affected by the warranty change includes self-contained and remote condensing units and heat pumps. There will be no change in the five-year warranty on the refrigeration circuit of room air conditioners.

Gray said: "We have taken this warranty revision step after extensive consultation with our own dealers and distributors. We believe that the former warranty system is unsound and will shortly be abandoned by the entire industry."

COMPLETE BANK MODERNIZATION JOB INCLUDES...

B&G

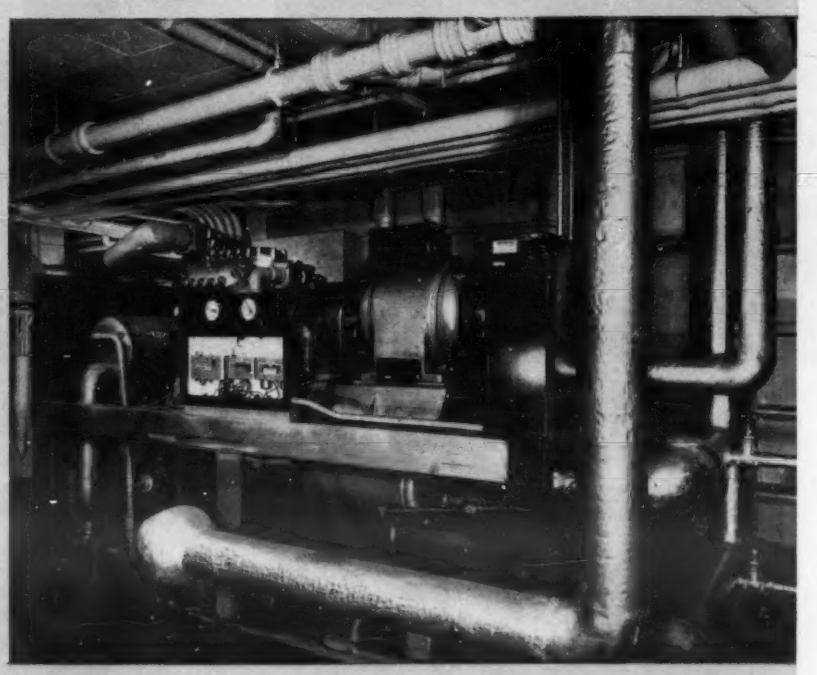
PACKAGE LIQUID COOLER

In this "100% remodeling" of The State Exchange Bank, Culver, Indiana, the old bank was stripped down to its framework and completely rebuilt inside and out.

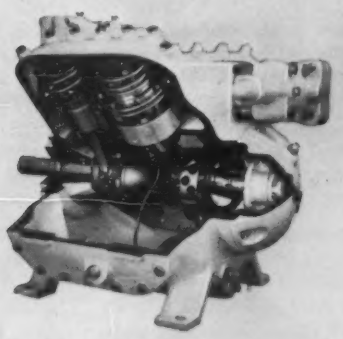
Remodeling included installation of a cooling system using a B&G Package Liquid Cooler, the advanced design unit that's completely new in conception.

Numerous features have been designed into this unit to make it more compact, more efficient and longer lived. It is equipped with B&G products throughout—the only unit of its kind with all major components designed, built and guaranteed by one manufacturer. Everything is included—there are no extras to buy. Thus costs which might otherwise be charged to the job are eliminated.

With all its advantages, the B&G Package Liquid Cooler is strictly competitive in price.



B&G Package Liquid Cooler installed in The State Exchange Bank, Culver, Indiana. This is a 40-ton capacity unit with a six-cylinder B&G Compressor. A B&G Series 1531 Centrifugal Pump circulates chilled water.



B&G COMPRESSOR

—a new unit to meet today's requirements

Like the Package Liquid Cooler this unit, too, is new in conception—not an adaptation of designs originated 20 years ago. Better design means fewer parts—and fewer maintenance problems. All units have *one* bore diameter—a few interchangeable parts will service them all. B&G Compressors can be equipped with multi-step capacity control systems.

A FULL LINE OF REFRIGERATION AND AIR CONDITIONING COMPONENTS

BELL & GOSSETT COMPANY

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Canadian Licensee: S.A. Armstrong, Ltd., 1400 O'Connor Drive, Toronto 16, Ontario

San Francisco Parley Probes Air Problems

BERKELEY, Calif. — Air problems from the standpoint of "Man and His Environment: the Air We Breathe" will be discussed at a conference in San Francisco Jan. 16-18.

Designed for physicians, physiologists, pathologists, ecologists, town planners, engineers, and others, the program is presented by the School of Medicine, and the Extension Service of the University of California.

Topics will include these: The "normal" atmosphere and its variation; the air pollution problem of industry; urban living and air pollution; and air-borne factors in cancer.

Specialists in each field have been "recruited," the University reports, from Wales, Peru, England, New Zealand, and the United States.

Information about the conference will be furnished by Seymour M. Farber, M.D., of the Department of Continuing Education in Medicine and Health Sciences, at the University of California Medical Center, San Francisco 22.

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For Your Reprint Copy

"Short, Short Course in Air Conditioning Fundamentals." By D. C. Schaffer. Mail this ad with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort, Detroit 26, Mich.

Only 25¢ each.

Detroit Edison Offers Electric Heating Workshop for Architects, Engineers

DETROIT—A five-week electric heating workshop for architects and engineers will be offered here by the Detroit Edison Co.

According to Alfred Sangster, coordinator of space heating and air conditioning commercial sales, Detroit Edison, the two-hour classes will be held each Wednesday from 6:30 to 8:30 at the company's sales auditorium, 2000 Third.

On the last night of the workshop, Feb. 24, Pat Dwyer of the utility will answer questions submitted by attendees on their registration questionnaires, and Sangster will present a number of commercial applications of electric heat around the Detroit Edison system.

Among the discussions to be conducted:

Economics of electric heating large buildings; economics of insulation; designing and engineering school buildings for electric heat; electric heating for a Detroit hospital; controls; compound heat pump installations; multiple package heat pump installation in a Detroit church.

"New items to be covered include integrated heating, lighting, and air conditioning systems, and a couple of off-peak installations being experimented with by Detroit Edison," said Sangster.

Crane Purchase Proposal Includes All National-U. S. Radiator Divs.

JOHNSTOWN, Pa.—Theodore B. Focke, president of National-U. S. Radiator Corp., has revealed further details of the planned purchase of the corporation's operating assets by the Crane Co.

As reported in the Dec. 28 issue of the NEWS, the acquisition has been approved by the board of directors of both companies but is subject to the approval of National-U. S. stockholders.

For $15 million in cash, the plant equipment and inventory will be transferred to Crane Co. on Feb. 1 after approval by stockholders of National-U. S. in January, according to the statement by Focke.

Involved in the sale are all divisions of the corporation. These are Drayer-Hanson, Los Angeles; Cyclotherm, Oswego, N. Y.; Pacific Steel Boiler, Johnstown, Pa.; Viking Air Products, Cleveland; Plastic Metals, Johnstown, Pa.; Marine Products, Middletown, Pa.; Heat Transfer, New York City; Heating & Air Conditioning Div. and Special Products, Johnstown, Pa.

"It is the stated intention of the Crane Co.," Focke said, "to operate the business substantially as conducted in the past, either as a subsidiary or a division of Crane."

The present management and employes will continue, he added. National-U. S. employs approximately 3,000 people in nine manufacturing plants throughout the U. S.

Focke pointed out that the agreement provides certain safeguards of employes' past service records with the corporation or predecessor companies, particularly as this applies to seniority, vacations, pensions, etc.

Total sales of the corporation during the past fiscal year ended March 31 amounted to about $54,000,000, with better than 50% of sales in heating and air conditioning, it was pointed out.

After a recent directors' meeting, William T. Golden, chairman of National-U. S. and Focke stated that the directors of the firm "are unanimously in favor of the sale." They feel it to be advantageous to National-U. S. stockholders and point out that it will be beneficial as well to employes of National-U. S., since it will make them part of a larger and expanding organization."

Trane Announces 10-Week School In Detroit

DETROIT—The Trane Co., in conjunction with the University of Detroit, will present an air conditioning school starting Jan. 13 and running for 10 weeks, it was announced recently.

Each session will last two hours—from 8 to 10 p.m. Talks, liberally illustrated with slides, will present a simplified interpretation of the technical subjects of refrigeration and air conditioning, it was pointed out.

Topics of the sessions are: The refrigeration cycle; refrigeration piping; refrigeration controls; refrigeration compressors and accessories; cooling load estimates; the psychrometric chart; equipment selection; installation and start-up of self-contained air conditioners; trouble diagnosis; and compressor disassembly and reassembly.

A fee of $12 will be charged to cover the costs of text books, literature, and nominal expense.

The clinic is designed to assist the small heating and air conditioning contractor better to understand the industry in which he is working, according to Dave Canfield of Trane's Detroit district, 15370 Schaefer Hwy. (telephone: BRoadway 3-3500).

1960 ARI Meeting Set for Nov. 18-22 At Hollywood, Fla.

WASHINGTON, D. C. — Air-Conditioning & Refrigeration Institute will hold its 1960 annual meeting at the Hollywood Beach (Fla.) hotel Nov. 18 through 22, it was announced by Rudy Berg, president.

This session will be the first ARI annual meeting since its members voted to change the institute's fiscal year to coincide with the calendar year. Previously the meetings had been held in May.

Berg also announced that the ARI board of directors will meet May 2-3 at the Homestead, Hot Springs, Va.

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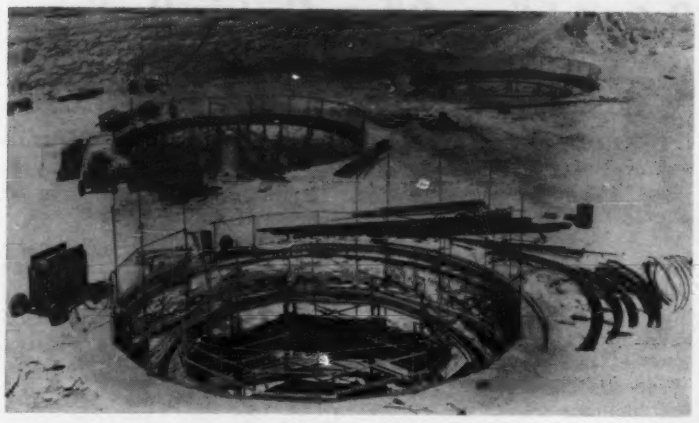
Worthington Puts Air Conditioning, Other Equipment In 1st Titan Bases



THIS VIEW OF PART of the Titan ICBM missile base at Lowry Air Force Base near Denver, shows a three-silo complex. Front to back are fuel storage silo, missile silo (where Titan will be kept), and equipment silo. Worthington Corp. was awarded Air Force contracts totalling $5 million for air conditioning, diesel engines, generators, compressors, and a wide variety of instrumentation equipment.

HARRISON, N. J. — Worthington Corp. announced it will supply five major categories of shock-proofed mechanical equipment for the first operational Titan ICBM bases now being built near Denver.

The firm reported it has been awarded Air Force contracts totalling $5,000,000 for air conditioning, diesel engines, generators, compressors, and a wide range of instrumentation equipment.

The Titan bases, Squadrons I and II, which will cost $67,000,000 are under construction on the Lowry Air Force Base bombing range outside Denver.

Completely underground, with reinforced concrete walls that range from 1 to 10 ft. thick and utilizing shock resistant equipment throughout, the two squadrons will provide six entirely self-sufficient missile launching sites.

It would take a direct hit by a nuclear warhead to knock out the ability of any one of the Titans to strike back in case of enemy attack, according to experts.

The missiles themselves will be stored and fired from silos extending underground 165 ft., or approximately 15 stories.

Two 300-Ton Air Conditioners To Each Launching Pad

Each squadron consists of three launching pads together with underground chambers for equipment and personnel. Each pad will have its own powerhouse containing four diesel engines driving 1,000 kw. generators and two 300-ton air conditioning units. Compressors for shop and instrument air will be located in equipment terminal buildings.

Commenting on the continued importance of the construction industry in the nation's missile program, Walter H. Feldmann, Worthington president, pointed out that the industry accounted for $750 million of the missile total in 1959 and may take a billion dollar slice of the business in fiscal 1960.

Worthington's principal contract called for 24 diesel engines and generators, 12 chillers, and 18 compressors together with auxiliary pumps and other equipment.

The varied equipment is being manufactured in Worthington plants in Harrison and East Orange, N. J.; Buffalo; and at Electric Machinery Mfg. Co., a subsidiary in Minneapolis.

Under a separate contract, Worthington's control valve and regulator division, Mason-Neilan Corp. of Norwood, Mass., will supply a wide range of instrumentation equipment.

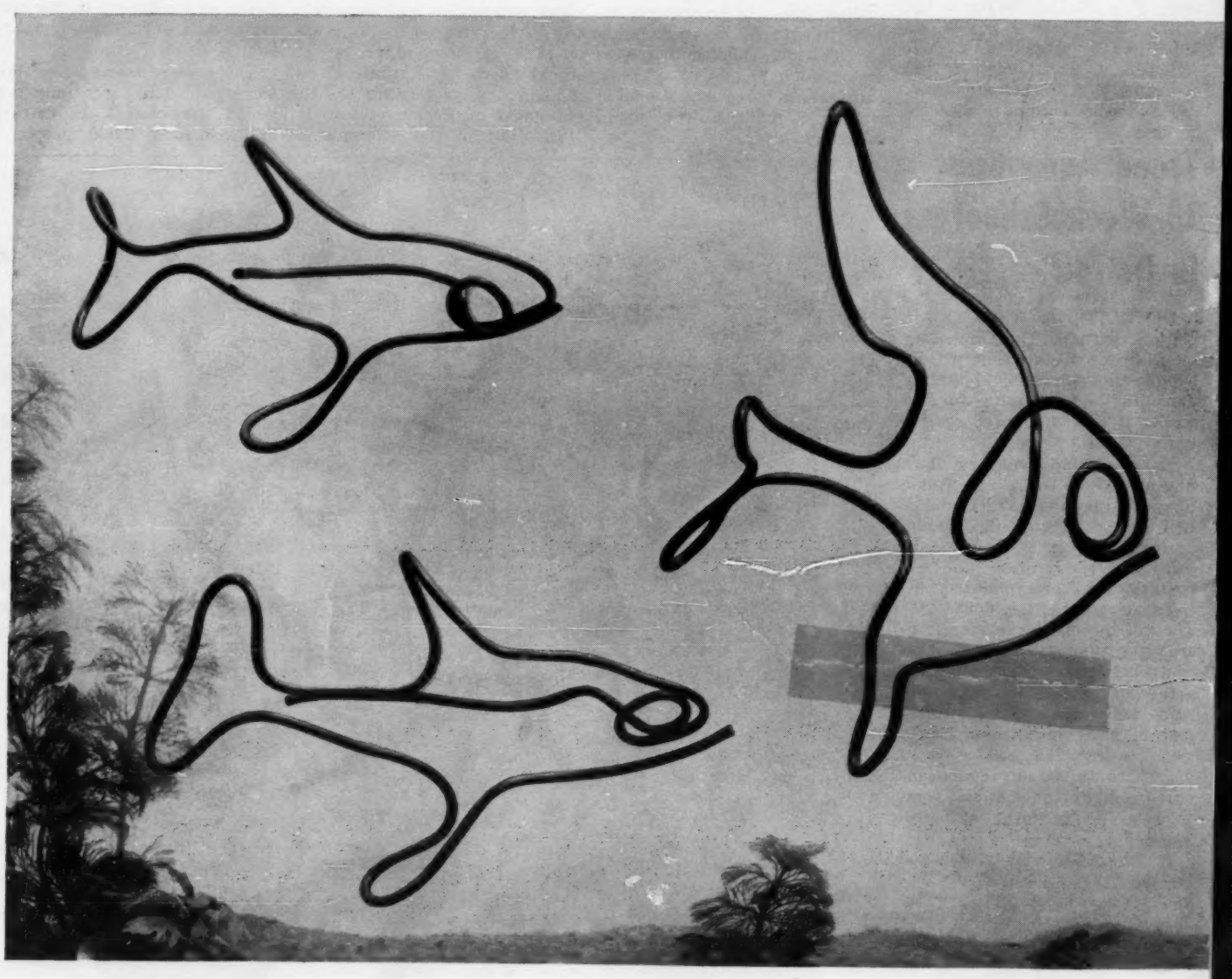
Installations for a three-missile complex as planned for the new Titan bases will include:

1. Three silos for vertical storage and firing of the 90-ft. 222,000-lb. missile.

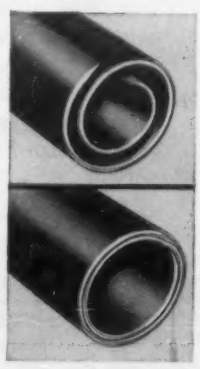
2. A control center in the form of a hemisphere 99 ft. in diameter. This will provide living quarters on the lower level and make it possible for the men to live and fire the missiles without ever venturing above ground.

3. A slightly larger hemisphere for use as a powerhouse. It will contain Worthington diesel generators and air conditioning equipment to make the installation self-sufficient and liveable in time of attack.

4. Two antenna silos, each



There's almost no limit to the things Bundy can mass-fabricate



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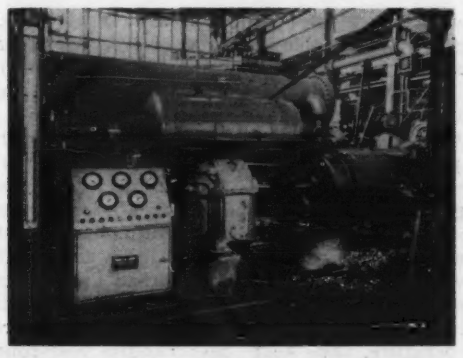


SHOWN ON TEST at Worthington's Harrison plant is one of the 12 centrifugal water chillers being constructed for the Titan Base. Each of these chillers will have a capacity of 300 tons.

27 ft. in diameter and 65 ft. deep.

5. Three equipment terminals 37 ft. wide and 35 ft. deep.

6. Three propellant storage areas 29 ft. deep.

7. Communication tunnels connecting the various facilities.

The U. S. Corps of Engineers is the government construction agency building the bases for the Air Force Ballistic Missile Div. The 703d Strategic Missile Wing will command both when the bases become operational.

The design was accomplished by the Air Force Ballistic Missile Div. using the firm of Daniel, Mann, Johnson, Mendenhall & Associates of Los Angeles.

The construction combine headed by Morrison-Knudsen & Associates include: Johnson, Drake & Piper Co.; Paul Hardeman, Inc.; F. E. Young Construction Co.; and Olsen Construction Co.

Let Cooling Contract For Knoxville Hospital

KNOXVILLE, Tenn. — The Baptist hospital here will be air conditioned at a cost of about $342,000. John F. Humphrey, this city, has the contract, the announcement stated.

York Realigns Engineered Machinery Dept.

YORK, Pa.—A realignment of responsibility within the Engineered Machinery Sales Dept. of the York Div. of Borg-Warner Corp. has been announced by C. J. Schurman, general sales manager.

Under the new delegation of responsibility, F. C. Wood has been promoted from midwestern manager to manager, air conditioning sales.

W. H. Devine, manager, refrigeration sales, and W. S. Miller, manager, marine sales, retain the same titles, but assume new authority over an expanded regional and divisional sales force.

Schurman said that the change is part of York's policy of promoting within the organization wherever possible to meet the needs of growing markets.

"This new vertical alignment will permit our sales managers to concentrate more closely on the equipment and markets under their supervision," he said.

Schurman pointed out that industry sales of engineered machinery are growing rapidly. "With the market for this equipment less than 10% saturated, we foresee a doubling and tripling of our sales within the next few years."

Working directly under the sales managers will be seven regional managers, each responsible for a specific geographic section of the country. These are: E. J. Berlet—north Atlantic region; T. Y. Davis—middle Atlantic region; W. W. Salmond—southeast region; R. A. Johnson—east central region; R. E. Miller—central region; G. C. Briley—southwest region; C. P. Strickland—Pacific region.

Schurman also announced the appointment of J. V. Clippinger as manager, parts and accessory sales.

Clippinger has been associated with the York parts depot program from its inception. He will now be responsible for administration of the program and for integrating its activities with the company's other sales objectives.

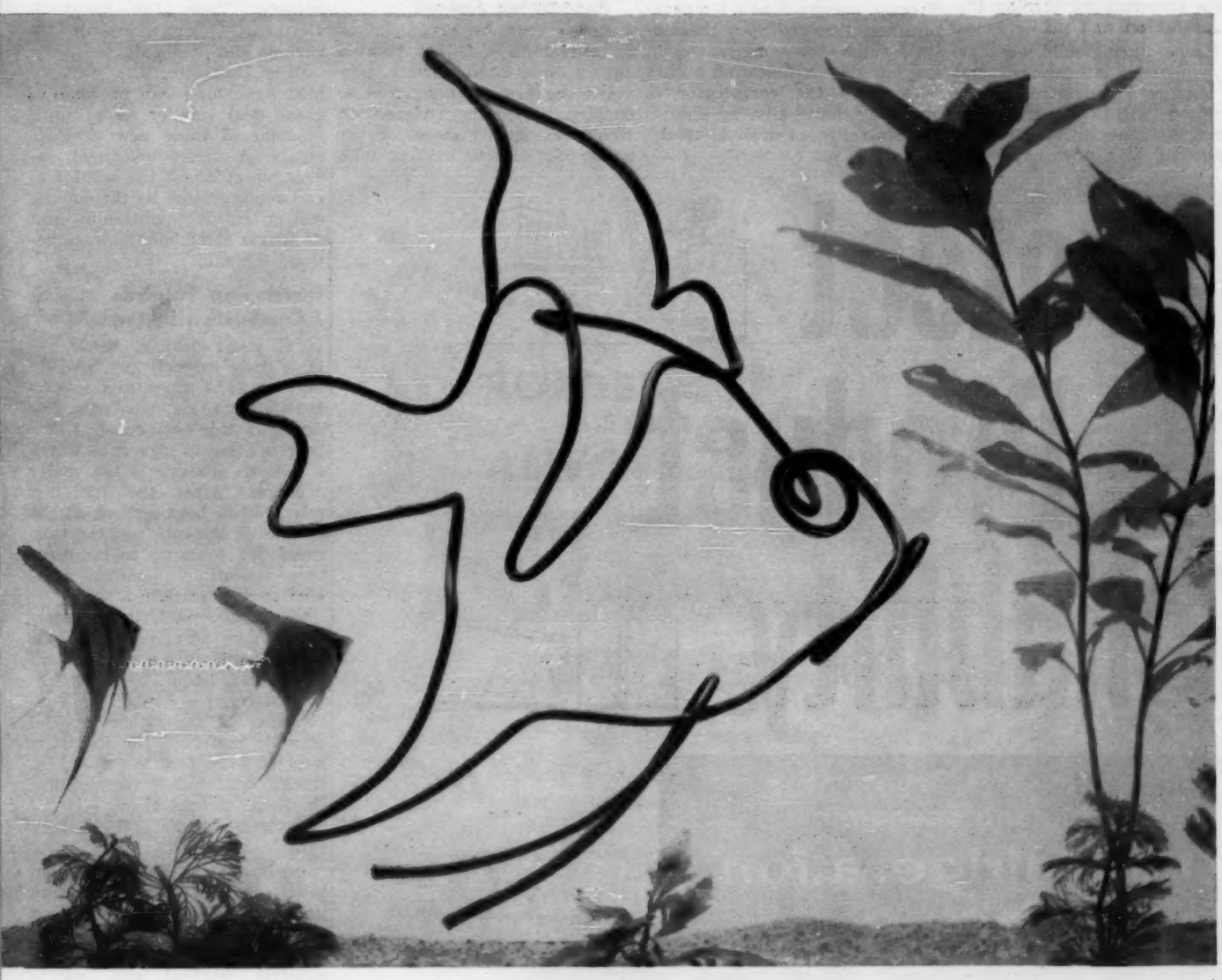
Halloran, Lebair Get Vice Presidencies

YORK, Pa.—Henry M. Haase, president of the York Div. of Borg-Warner Corp., has announced the appointment of R. J. Halloran and M. S. Lebair as vice presidents of the company.

Halloran, now general manager of the Decatur (Ill.) Works, becomes vice president York Div., manager - Decatur Works.

Lebair, presently assistant vice president and assistant director of marketing, becomes vice president and director of trade relations.

Halloran will continue to report directly to E. F. Peslar, vice president and director of operations. Lebair will continue to report to Austin Rising, vice president and director of marketing.



The discharge coil for this air-conditioning compressor is 5/16" x 37½" with one end sized to ⅛" I.D.; tight-tolerance fabrication allows coil to clear inner casing and outer shell of compressor.

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Reheat, Modulation

Need for 'True' Year-Round Systems Stressed by NWAHACA Technical Head

ST. LOUIS — Need for development of true "year-round air conditioning" that will provide comfort in spring and fall as well as summer and winter was stressed in a talk on current trends by H. T. Gilkey, director of technical services for National Warm Air Heating & Air Conditioning Association, at the group's 46th annual meeting here.

"Basically, we have had a two-season system, a heating system for winter and a cooling system for summer," he said. "Furthermore, our systems have generally worked best when they were under full load or very nearly full load," he added.

"This problem exists with both heating and cooling equipment. During mild weather, heating equipment is usually sized for the maximum load which will be experienced. Furthermore, most of the equipment with which we are familiar has a single input rate, and we vary the amount of heat put into a structure by turning the equipment on and off.

"Hence, during mild weather, the equipment is oversized, and we tend to lose control of the conditions within the space. I'm talking in generalities here, for equipment is now available which has some input modulation," Gilkey explained.

"In cooling, we have just about the same situation. The equipment is either on or off, and during mild weather we tend to lose control of both temperature and humidity. Furthermore, in most of our systems we do not control humidity directly—we control it only indirectly, inasmuch as a temperature sensitive device, a thermostat, turns the compressor on and off. Dehumidification occurs only when the compressor is operating. Generally, no humidity controller as such is used," he said.

"In the case of summer air conditioning, it is possible to achieve humidity control by using one of several devices. Two-compressor systems have been used to do a partial job. Another practical approach seems to be the reheat system," Gilkey suggested.

With a reheat system, he explained, moisture is removed from the humid air as it passes through the cooling coil, and then the air is reheated to the desired temperature, thus keeping humidity at a low level without lowering the house temperature below the point of human comfort.

Several Ways To Accomplish Reheat

Reheat can be accomplished in several ways, Gilkey pointed out: a direct-fired furnace, provided the heat exchanger is so constructed that condensation won't damage it; steam or hot water coil; electric heating units such as a central electric furnace, duct heaters, or the supplemental elements in a heat pump; using heat rejected by the condenser.

Systems incorporating humidity control by means of reheat for humid weather and modulated heat for milder weather are available in "deluxe" systems, Gilkey indicated, but their widespread use will come about slowly "only as we change our own attitudes and promote and merchandise year-round air conditioning for what it is—year-round comfort—rather than a cheap way of getting heating in the winter and cooling in the summer."

In reviewing trends in the industry from the technical viewpoint, Gilkey commented on various developments.

"For example, the furnace heat exchanger can be made a great deal smaller as a result of some of these new developments. A direct-fired heat exchanger of about the same size and configuration as the cooling coil on an air conditioning unit no longer stretches the imagination," he said.

Developing Catalytic Combustion System

"A great deal of work has been done recently on developing methods of catalytic combustion using gaseous fuels. One device of this type consists of a porous ceramic tube into which a gas-air mixture is fed under pressure. After the fuel air mixture has been ignited on the outside of the tube and the tube itself has come up to temperature, essentially flameless combustion is maintained.

"The tube itself is incandescent and there is a surface plasma which has a temperature of around 1,800° to 2,000° F. Obviously, the tube is constructed of a rather special ceramic material, for its walls may be only from ⅛ to ¼ in. thick, while the temperature gradients across them may be in excess of 2,000 ° F., Gilkey said.

Such devices have been applied in theoretical heating units. In this case, combustion air is drawn into the combustion chamber, while the fuel, possibly natural gas, enters through the automatic valve. The combustion chamber is a catalytic combustion unit enclosed in which might be a stainless steel tube.

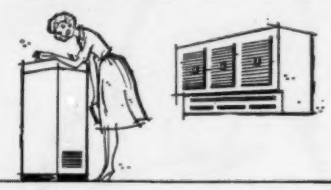
The products of the combustion then pass through the heat exchanger, which might be similar in appearance to the cooling coil of an air conditioning unit. The combustion products are then drawn through an induced-draft fan and exhausted under pressure.

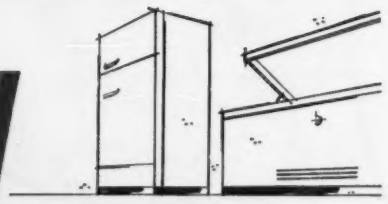
Furnace Could Be Smaller

"It has been estimated that the dimensions of a furnace of this sort could be about half the size of a gas-fired furnace as we know it today, assuming equal outputs. The efficiency could be increased somewhat, possibly 10 or 15%. Additionally, using an induced-draft fan, because of the higher efficiency and resulting lower exhaust temperature, could reduce materially the chimney requirements, both in size and in complexity," Gilkey suggested.

"This is not as far-fetched as

Protect Product Reliability





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Your dealers benefit, too, because KLIXON Controls assure trouble-free performance throughout the years. The result — long compressor life, reduced service calls, less factory returns for repairs and replacements.

Manufacturers of hermetic or open type compressors and builders of complete refrigeration, heating and ventilating equipment are invited to find out more about KLIXON Controls.

†Replacements are available through distributors.

*Over 200,000,000 KLIXON Controls are in use in refrigeration and heating equipment.

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it may seem at the moment. Catalytic combustion units have been built and are now in use, though not in central heating equipment as we know it. Furthermore, the principle of induced-draft venting is very commonly used in large commercial installations.

"During the last year, there has been put on the residential market an oil-fired furnace which utilizes this principle. Hence, it is only necessary to combine these two features—catalytic combustion and induced draft venting—in order to make this rather futuristic concept a reality," he said.

Thermionic Conversion

"Another approach to this general principle would be thermionic conversion. Application of this phenomenon is probably further in the future than is catalytic combustion. In its simplest form, a thermionic converter involves a heated plate and a cooled plate. Its operation is based upon the fact that electrons are emitted from metals at high temperatures.

"In a thermionic converter, electrons are emitted more rapidly from the heated plate than from the cool one, so that there is a net flow of electrons from the heated plate to the cool plate. This phenomenon was first discovered by Thomas A. Edison, and it is known as the 'Edison Effect,'" Gilkey commented.

Advances In Components Cited

Attention was also drawn by Gilkey to the advances that have been made and are in progress in components. He cited such things as simpler and relatively inexpensive electrostatic air cleaners, restyled and improved controls that respond to outdoor temperature changes, forced humidifiers, new materials for ducts, and supply outlets. Special attention was paid to the latter.

Diffuser Standard Being Developed

"There is an increasing consciousness by diffuser manufacturers of two things: first, performance requirements for supply outlets, and second, the appearance of their products. The first of these, performance, has resulted in more complete information on the pressure loss, throw, and spread characteristics being available. Additionally, better guidance is being given to the installer on the application of specific type of outlets," Gilkey explained.

"It is in this field that one of the most encouraging developments in the entire industry has taken place. Several of the association's register manufacturer members are cooperating in the development of a new standard for determining the effective area and pressure loss characteristics of their products.

"Modern diffusers are designed to do a specific air distribution job. Unfortunately, the designs required to do this are such that measuring the diffuser free area becomes extremely difficult. Strangely enough, the free area, or effective area as it will probably be called, can be more easily determined by test than by measurement," he said.

"Right now, several manufacturers are in the process of verifying this test method on several types of diffusers. When this work is completed, a standard will be issued, and we hope that you will give it your support. If you do support it, it will be a meaningful, effective standard, and you will be able to know exactly what the diffusers which you use will do and what they will not do," Gilkey declared.

"So far, we have talked about equipment and components—we have not talked about systems. In a sense, the system is far more important than either equipment or components, but it is far more difficult to discuss constructively. There are a few generalizations which can be made, however.

"Foremost among these is the fact that the air system is now being applied in a much greater variety of installations than ever before. It is receiving increasingly greater acceptance in apartment buildings, school buildings, and commercial structures. There are several reasons for this, and the reasons vary with the type of application.

Apartments, Schools Using Individual Heating, Cooling Systems

"In apartments, for example, a very common approach today is the use of individual heating units and systems for each apartment. This is brought about partly by the need for air conditioning in apartments, definitely a competitive factor from the standpoint of the landlord. Another consideration, however, is the desire by landlords for individual tenant operation and tenant responsibility for all utility bills, including heating," he commented.

"In schools, we find an increasing awareness of the fact that the flexibility and response characteristics of air systems assure the type of control necessary for maintaining proper conditions within the classroom. Children are easily distracted, and the right combination of temperature, air circulation, and air freshness are essential if our children are to benefit fully from their educational experiences.

"Furthermore, we taxpayers have learned the hard way that a school building is not a static thing, it needs to be expanded continually to keep overcrowding to a tolerable minimum. One of the problems involved in adding to any existing building is the extension of utilities, and the ever-present possibility that existing utility systems will have to be drastically and expensively enlarged in order to satisfy the requirements of the new portions of the structure.

"This has been minimized, insofar as heating is concerned, by the use of air systems in which one heating unit serves either an individual classroom or two adjacent classrooms. This approach also provides for flexibility of control and the fact that heating requirements vary drastically from one room to another at different times of the day. These are 'plus value' features, and are an addition to the inherent control and response characteristics of air systems," Gilkey said.

'Newsweek' Finds More Ready To Buy Cooling

NEW YORK CITY — *Newsweek's* latest survey of Consumer Buying Plans showed plans to buy air conditioners were up 31% from last year, the magazine reported.

The survey was made in September and October and is based on buying plans for the next six months.

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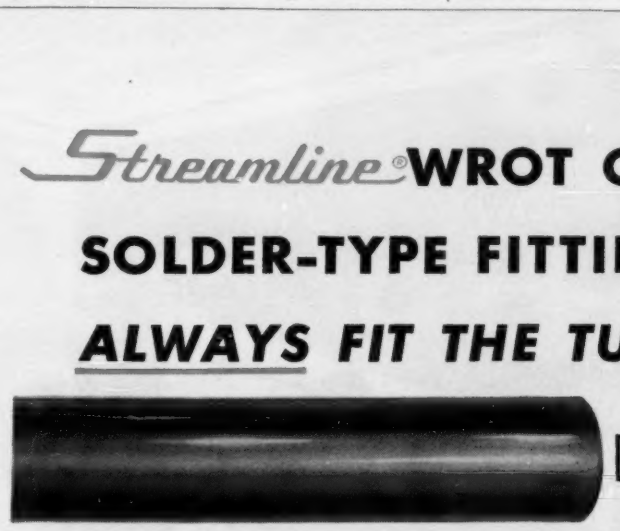

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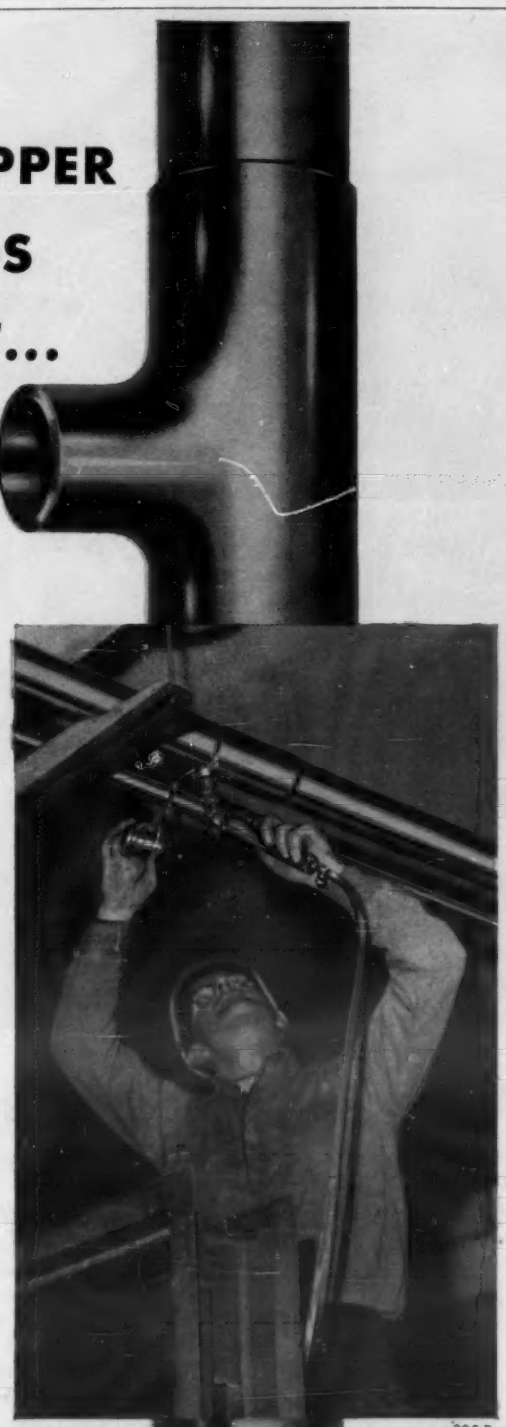

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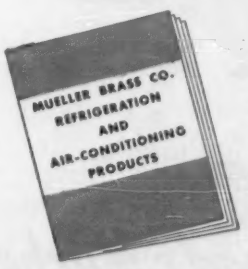

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Inside Dope

By GEORGE F. TAUBENECK

(Concluded from Page 1, Col. 1)

probably will tail off.

As to the first two of these worries, there seems to be a serene confidence on the part of manufacturers that if nothing happens at the bargaining table, Congress will move in quickly.

Let us hope so. (See editorial on page 12 of this issue.)

That new construction may drop, however, is a matter of genuine concern to all. In terms of residential erection there are these negative factors:

Rents are down, vacancies are high, and mortgage money is tight. Costs are rising—particularly land values and city taxes. And unemployment has slowed down emigration to many cities.

Adding up these factors, realty experts predict a drop of 12% to 20% in new home construction during 1960.

Industrial construction may lessen, too. Right now the emphasis is on automation *within* existing plants, rather than more brick-and-mortar.

Moreover, widespread voter resistance to higher taxes is killing off bond issues for schools, hospitals, and public buildings.

Possibly this narrowing of the market is an underlying reason for the most disastrous Price War—which now is going on—in the history of the industrial air conditioning business.

Let's Smile Again

So much for the pessimistic outlook. We shouldn't discount it. Neither should we be dismayed by it. Actually, the plus factors far outweigh the minus. Perhaps the greatest plus factor is psychological, to wit:

Contractor-dealers finally are convinced that air conditioning is an expanding market, and that it may become richly profitable.

Last year was the "break through," the Moment of Truth. This year may well provide that overdue Takeoff Point which we've been awaiting so long and so impatiently.

Why? Because the men who sell the stuff finally are in a mood to give our business a real whirl.

These conclusions are reached after talking with—and listening to—literally hundreds of subscribers in the last five months.

We've met them at scores of conventions, exhibitions, expositions, local meetings, luncheons, and dinners during that period. Nearly always the tenor of their conversation was:

"Last summer convinced me. Now I won't be afraid to stock up and push the stuff."

Industry inventories, incidentally, are at the lowest point since the end of World War II.

From the manufacturers' outlook, an even more optimistic indicator is the enormous expansion of foreign business.

All of a sudden the whole world wants refrigeration, heating, and air conditioning. The United States of America has the only background of experience, and the sole reservoir of "know-how," in those related fields.

Whether through licensing, branch factories, or exporting, canny men in our industry are moving rapidly to take advantage of this highly profitable phenomenon.

All in all, 1960 shapes up as a possibly tremendous year.

Frank and Jack, They Aren't Alack

Two of the youngest members of the NEWS staff, Frank Versagi and Jack MacLean, recently became fathers. This was not a new experience for either.

For Frank it was the fourth trip; for Jack, number *seven.* To them we respectfully dedicate this limerick:

There was a young lady named Kate
Who had just had kid number eight.
She looked at her Jim,
Who was chock full of vim,
And said: "Why don't you go get a date?"

Out of Our Mailbag

Electriliving Corp.
Indianapolis, Indiana

Editor:

Congratulations on your Air Conditioning editorial in your Nov. 16th issue.

Your closing paragraph: "Is air conditioning a business, or is it a silly game of give-away checkers which nobody wins?" strikes home when one observes the growing pricemanship in the absence of salesmanship, which too rapidly is carrying over into the electric home heating field.

In our recent Phoenix Farm Power Council meeting we had three speakers independently reiterate that the consumer is the BOSS, or KING. Pricemanship, and the continuation of poor quality, always seems to ignore this customer-control fact.

CLEMENT L. STANFORD

National Commercial Refrigerator Sales Association
Philadelphia, Pa.

Editor:

We were indeed interested to see your editorial, "Are Commercial Refrigeration People Neglecting the Ma-and-Pa Store Market?" With your permission, we would like to reproduce this for further distribution.

We were very much interested in the fact that this tied in with a talk at our Convention by Aubrey J. Deal of Deal-Warren Refrigeration Co., Jacksonville, Florida, who spoke on how he helps the small neighborhood store to modernize and thus stay in business, despite the large supermarkets.

MARIE LAWTON,
Executive Secretary

The Brewer-Titchener Corp.
Cortland, New York

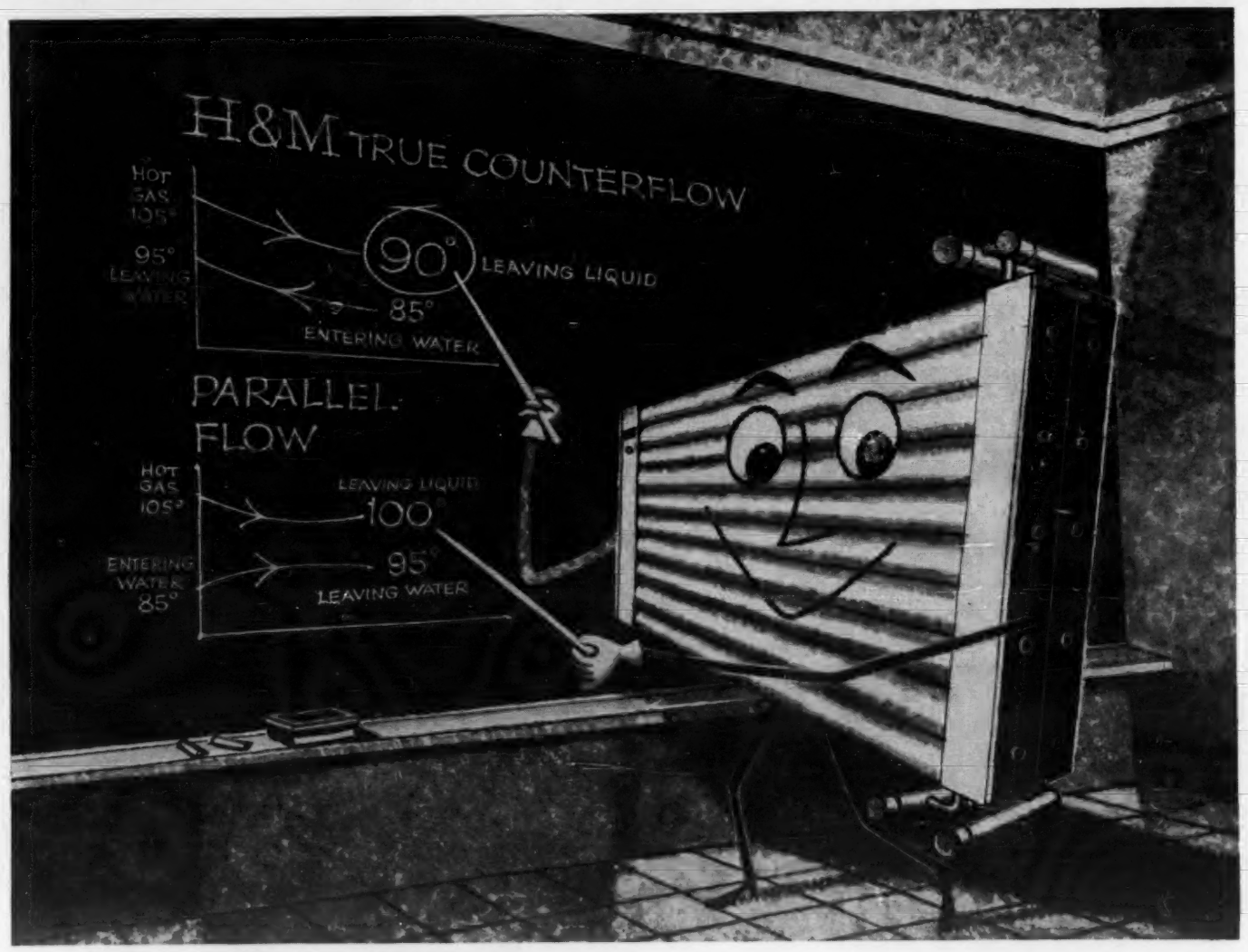
Editor:

I have just read for the third time your "Inside Dope" column about Puerto Rico. My sincerest congratulations on the very objective description.

I lived there for two years shortly after the War and was in charge of establishing the first really large manufacturing operation under the self-aid program.

I came to know the Puerto Ricans of all classes and I must say that I was and continue to be very fond of them.

FREDERIC A. CELLER,
Vice President for Sales



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H&M condensers feature double-tube design, seamless copper tubing, brass headers. End plates are easily removed for quick, safe, *mechanical* cleaning. Water tubes are generously sized for low pressure drop and minimum maintenance. Available in ⅕ to 25 ton capacities, condenser types are Standard (½" and ⅝" O.D. water tubes), Heavy Duty (⅝" O.D. water tubes), and Sea Water (⅝" O.D. cupro-nickel water tubes), and are U/L approved. Order them from your refrigeration wholesaler and use them singly or on racks. Halstead & Mitchell, Bessemer Building, Pittsburgh 22, Pa.

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ASHRAE Program for Dallas Meeting--

(Concluded from page 2)

condensers, pipes and pick-up factors for boilers, and thermoelectric refrigeration.

All committee meetings will be held at the Baker.

Special events include a Texas Roundup, banquet and dance, and a ladies program including a "Coffee Corral" and a Texas style show.

Meeting and exposition are being jointly sponsored by the Fort Worth and Dallas chapters of ASHRAE. C. Rollins Gardner of Fort Worth is general chairman.

Exposition is under the management of the International Exposition Co. of New York.

Program follows:

SATURDAY, JAN. 30

8 a.m.—Advertising committee breakfast meeting, Camelia Room.

9:30 a.m.—Finance committee, Room 4.

12:30 p.m. — Executive committee luncheon meeting, Room 5.

2 p.m. — Research and Technical Executive committee, Room 4.

4 p.m.—Regions Central committee dinner meeting, English Room.

SUNDAY, JAN. 31

10 a.m.—Advance registration, Mezzanine, Baker hotel.

10 a.m. — Research and Technical committee, English Room.

2 p.m.—International Relations committee, Camelia Room.

Meeting Arrangements committee, Room 310.

Membership Development committee, Room 5.

Standards committee, Room 4.

2-5 p.m.—You ALL Come. Texas Room.

5 p.m.—Board of directors dinner meeting, English Room.

MONDAY, FEB. 1

7:30 a.m.—Speakers breakfasts.

8:30 a.m.—Registration, Mezzanine, Baker hotel.

9 a.m.—General Assembly, Terrace Room, Baker hotel.

Opening remarks by President A. J. Hess.

Address of welcome by W. J. Collins, Jr., Director, Region VIII.

Polls open for election of board of directors.

9:30 a.m.—**First Technical Session,** Terrace Room.

A. J. Hess, officer in charge.

Chairman, S. J. Williams, Cleveland.

"Necessity to Insulate Floors at 35° F. Cold Storage Sitting Directly In Soil"—J. D. Hovanesian, professor, Dept. of Agricultural Engineering, Pennsylvania State university.

10:15 a.m.—"A method of Comparing Heat Exchangers"—D. G. Rich, Sr., research engineer, Carrier Corp.

11 a.m.—"Frost Formation on Coils" —W. F. Stoecker, professor, Dept. of Mechanical Engineering, University of Illinois.

11:45 a.m.—"Frost Formation Upon a Thin Aluminum Tank Containing Liquid Oxygen"—J. L. Roper, Sr., research engineer, The Western Co., Fort Worth, Texas.

9:30 a.m. — **Domestic Refrigerator Symposium,** Ballroom, Adolphus hotel.

Chairman, H. P. Harle, project enneer, Household Refrigerator Dept., General Electric Co.

"Should Plastics Be Used In Refrigerators?"—W. L. Farley, vice president, White Stores, Inc., Wichita Falls, Texas.

10 a.m.—"Realistic Properties of Plastics Materials Applied to the Requirements of the Refrigeration Industry"—William E. Brown, head of testing section, Plastics Technical Service, Dow Chemical Co.

10:30 a.m.—"Assurance of Satisfactory Performance of Plastic Parts in Refrigeration"—Dale Amos, president, Amos Molded Plastics Div., Amos-Thompson Corp., Edinburg, Ind.

12 Noon—Opening Ceremonies—Second Southwest Heating and Air Conditioning Exposition, Memorial Auditorium.

12:45 p.m.—Welcome Luncheon, Ballroom, Baker hotel. Advance reservation required.

Speaker, Dr. Willis M. Tate, president, Southern Methodist university.

Installation of officers.

2 p.m.—Polls close for election of board of directors.

2:30 p.m. — Exposition committee, Tally Ho Room.

Honors and Awards committee, Camelia Room.

Program committee, Room 4.

Publications committee, Room 5.

6:30 p.m.—Texas Round-Up, Fair Park Coliseum. Advance reservation required.

TUESDAY, FEB. 2

7:30 a.m.—Speakers breakfasts.

8:30 a.m.—Registration, Mezzanine, Baker hoel.

9:30 a.m.—**Second Technical Session,** Terrace Room.

D. D. Wile, president, officer in charge.

Chairman, W. E. Fontaine, professor, School of Mechanical Engineering, Purdue university.

"Noice Reduction Characteristics of Package Attenuators for Air Conditioning Systems" — Norman Doelling, Bolt, Beranek, and Newman, Inc., Cambridge, Mass.

10:15 a.m.—"Attenuation and Generation of Sound in Elbows with Turning Vanes"—William F. Kerka, research engineer, ASHRAE Research Laboratory.

11 a.m.—"Draft Performance of Chimneys"—W. G. Brown and C. Wachmann, research officers, Div. of Building Research, National Research Council of Canada, Ottawa.

11:45 a.m.—"Flow of Saturated Steam in Copper Tubing"—C. M. Humphreys, assistant director; J. T. Baker, research engineer; and B. H. Jennings, director, ASHRAE Research Laboratory.

"Re-evaluation of Steam Pipe Size Tables for the ASHRAE Guide"—William F. Kerka (by title only).

9:30 a.m.—**Air Conditioning Symposium,** Ballroom.

Chairman, William R. Moll, sales manager, air conditioning and dehumidifier sales to Sears, Whirlpool Corp.

Engineering Responsibilities.

—P. M. Augenstein, president, Airtemp Div., Chrysler Corp.

—Austin Rising, vice president and director of marketing, York Div., Borg-Warner Corp.

—William Spiegelhalter, chief engineer, room air conditioning section, General Electric Co.

—Gerhardt Stoll, director of research, Whirlpool Corp.

12 Noon to 10 p.m.—Exposition Open.

12:30 p.m.—ASHRAE Life Members Club luncheon.

2 p.m.—Forums.

E. N. Johnson, engineer, Swift & Co., in charge.

1. Automotive Air Conditioning
2. Frozen Food Problems
3. Industrial Ventilation
4. Practical Size Limitation of Air Cooled Condensers
5. Pipes and Pick-Up Factors for Boilers
6. Thermoelectric Refrigeration

2 p.m.—Admissions and Advancement committee, Camelia Room.

Education committee, Room 4.

6:30 p.m.—Past-Presidents' dinner.

WEDNESDAY, FEB. 3

7:30 a.m.—Speakers breakfasts.

8:30 a.m.—Registration, Mezzanine, Baker hotel.

9:30 a.m.—**Third Technical Session,** Terrace Room.

W. A. Grant, first vice president, officer in charge.

Chairman, R. A. Line, engineer, Hussmann Refrigerator Co.

"Effects of Compressor Characteristics on Motor Performance"—E. H. Jensen, Air Conditioning Div., Westinghouse Electric Corp.

10:15 a.m.—"Muffler Design by Computer Technique" — B. W. Hatten, Westinghouse Electric Corp.

11 a.m.—"Use of Activated Carbon to Decrease Odor and Odor Transfer in Domestic Refrigerators"—A. L. Brody, food technologist; J. W. Thomas, chemical engineer; and L. M. Lafeber, home economist, Whirlpool Corp.

11:45 a.m.—"Solar Heat Gain Factors for Windows with Drapes"—NecatiOzisik, research engineer, and L. F. Schutrum, research supervisor, ASHRAE Research Laboratory.

9:30 a.m.—**Psychrometric Chart Symposium,** Regency Room.

Chairman, P. N. Vinther, consulting engineer, Zumwalt and Vinther, Dallas.

"High Altitude Psychrometric Charts"—R. W. Haines, consulting engineer, Bridgers and Paxton, Albuquerque, N. M.

"Psychrometric Chart for Altitudes Above Sea Level"—J. L. Threlkeld, professor, Dept. of Mechanical Engineering, University of Minnesota.

"Thermodynamic Consistency in the Graphical Presentation of Psychrometric Data"—J. A. Goff, professor, School of Mechanical Engineering, University of Pennsylvania.

"The Psychrometic Chart Can Be Improved"—C. M. Ashley, chief staff engineer, Carrier Corp.

"Psychrometric Charts from the Users' Viewpoint"—D. D. Wile, vice president and chief engineer, Recold Corp.

12 Noon to 10 p.m.—Exposition open.

6 p.m.—President's Reception, French Room, Adolphus hotel.

7:30 p.m.—Banquet, Grand Ballroom. Advance reservation required.

Speaker: Dr. Kenneth McFarland, educational consultant, General Motors Corp. and guest lecturer for "Readers Digest."

Presentations

9 p.m.—Dancing to Ted Weems and his Orchestra, Crystal Ballroom, Baker hotel.

THURSDAY, FEB. 4

7:30 a.m.—Speakers breakfasts.

8:30 a.m.—Registration, Mezzanine, Baker hotel.

8:30 a.m.—General and Administration Coordinating committee, Camelia Room.

Technical Coordinating committee, Room 4.

9:30 a.m.—**Fourth Technical Session,** Terrace Room.

R. H. Tull, second vice president, officer in charge.

Chairman, R. S. Buchanan, manager, development section, Westinghouse Electric Corp.

"Alaska Summer Weather Data"—A. Burggraaf, design draftsman, Harmon and Beckett, Inc., Denver.

10:15 a.m.—"Summer Weather Design Data"—H. C. S. Thom, chief climatologist, U. S. Weather Bureau, Washington, D. C.

11 a.m.—"Environmental Study II—Evaluation of Human Comfort Under Still Air Conditions" — Dr. Walter Koch, medical research supervisor, ASHRAE Research Laboratory.

11:45 a.m. — "Proposed Humidity Standard"—C. E. Till, formerly junior research officer, Div. of Building Research, National Research Council, Ottawa; and G. O. Handegord, Prairie Regional Station, Div. of Building Research, National Research Council, University of Saskatchewan.

9:30 a.m.—**Fenestration Symposium,** Regency Room.

Chairman, Prof. E. R. Queer, engineering research, Pennsylvania State university.

The Role of Fenestration in Air Conditioning.

"The Architect's View on Fenestration"—W. W. Caudill, architect, Bryant, Texas.

"Design Problems Due to Fenestration"—P. N. Vinther.

"Effect of Lighting on Air Conditioning Loads"—W. F. Spiegel, consulting engineer, Charles S. Leopold, Inc., Philadelphia.

"Ultimate Cost of Fenestration"—E. R. Queer and E. R. McLaughlin, consulting engineers, University Park, Pa.

12 Noon to 10 p.m.—Exposition open.

12:30 p.m. — Board of directors luncheon meeting, English Room.

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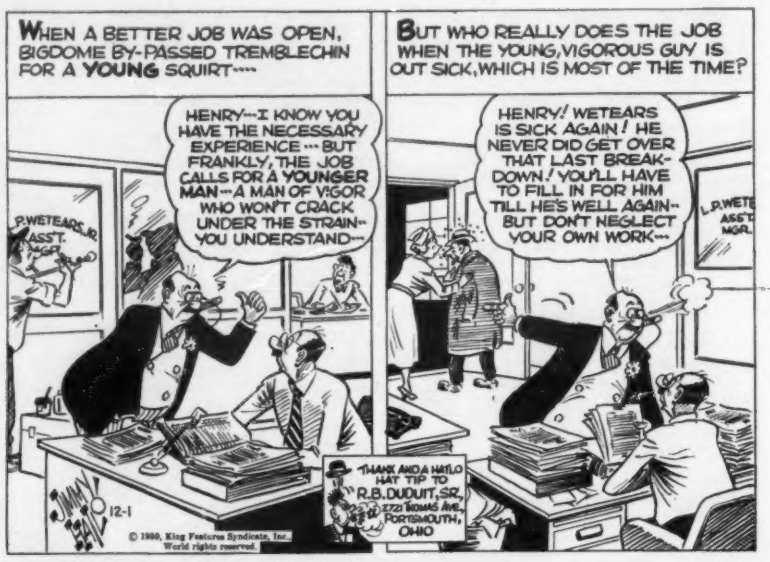
WHEN A BETTER JOB WAS OPEN, BIGDOME BY-PASSED TREMBLECHIN FOR A YOUNG SQUIRT····
BUT WHO REALLY DOES THE JOB WHEN THE YOUNG, VIGOROUS GUY IS OUT SICK, WHICH IS MOST OF THE TIME?
HENRY···I KNOW YOU HAVE THE NECESSARY EXPERIENCE··· BUT FRANKLY, THE JOB CALLS FOR A YOUNGER MAN···A MAN OF VIGOR WHO WON'T CRACK UNDER THE STRAIN··· YOU UNDERSTAND···
HENRY! WETEARS IS SICK AGAIN! HE NEVER DID GET OVER THAT LAST BREAK-DOWN! YOU'LL HAVE TO FILL IN FOR HIM TILL HE'S WELL AGAIN··· BUT DON'T NEGLECT YOUR OWN WORK···
P. WETEARS, JR. ASST. MGR.
L.P. WETE ASS'T. MGR.
THANK AND A HATLO HAT TIP TO R.B. DUDUIT, SR. 2721 THOMAS AVE. PORTSMOUTH, OHIO
12-1
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Strikes, Like Wars, Are Senseless; Why Can't We Have Labor Courts?

(Concluded from Page 1)

from steel, and their employes. The latter weren't on strike—but they become unemployed, through no fault of their own, because others chose to prolong a one-industry argument.

Real issue in the steel deal wasn't wages at all. It involved a revolutionary new principle which, apparently, monopoly unions like the steelworkers are endeavoring to establish.

Although they don't come right out and say so, such big unions are trying to make this "principle" come true:

(a) Corporations own plants and machinery, but—

(b) Unions own the jobs.

Note well that it isn't union *members* who "own" their jobs.

It is the union itself which stipulates who shall be hired and never fired, how much or how little work he does, what type of work he can be assigned, and the manner in which he performs it.

Again, this "fact of life" never has been stated openly by anybody. In practice, nevertheless, it has become unwritten law. And it was this yoke which the steel companies were trying to doff. . . .

In the meantime millions upon millions of American citizens who weren't party to this strike lost work and money. The whole thing was unjust, unfair, and undemocratic to "We the People"—the innocent bystanders.

Isn't it about time that we Americans "grow up" and take a realistic, sensible attitude toward union-management bargaining on a nationwide scale?

In medieval times disputes were settled, not in court, but by physical combat. The guy who could kill or maim the other party to an argument was deemed "right."

Nowadays "trial by battle" exists only in the field of union-management palaver. All other arguments over property rights are taken to court. Duelling with swords or pistols is as out-of-date as it is silly. Likewise, strikes.

"Compulsory arbitration" still is a dirty hyphenated word. Everybody seems to oppose it. Certainly neither management nor labor (or newspaper and magazine editorial writers, for that matter) espouse it.

O.K. Let's drop it. Instead, let's get semantically civilized and start talking about "labor courts."

They have proved to be entirely satisfactory in booming Australia—whose people are more like Americans than any other national population. Decisions by Australian tribunals are binding on both labor and management. And, after many years of experience with labor courts, everybody down there seems happy about the results.

This successful Australian system has tended to widen the gap between rank-and-file members and labor union bosses, to be sure. Union members apparently see less and less reason for kowtowing.

Nevertheless, approximately 70% of this country's wage and salary earners belong to unions of one sort or another. To attain a similar proportional strength, U.S. union membership would have to total 46 million people. At present only 18.5 million American workers are union members.

Even bank officials have a union of their own to negotiate working conditions with Boards of Directors! In a "labor catalog," the Bank Officers Association of Australia is listed alphabetically just ahead of the Blacksmith's Society.

Engineers, architects, draftsmen, theater managers, railway officials, doctors, lawyers, jockeys, hospital superintendents, and numerous other professional and managerial people are unionized in Australia.

Theoretically, labor courts can step in only after a dispute has deadlocked. Practically, ALL such disputes go to court—whereupon:

Every employer and employe represented in a typical wrangle freely complies with a judge's verdict.

Union officers seem content, in Australia, with this arrangement. Management likes the stability it provides. Actually, they say, it seems fair to have a system whereby an independent judge makes an impartial decision on a labor question.

"I've had it both ways, under the compulsory arbitration system and under the negotiation system where you bargained with a union for months to reach an agreement," remarks a top Australian business executive. "I prefer the arbitration system."

Today the United States is engaged in commercial competition, and an economic race, with Russia and a whole slew of vigorously resurgent foreign powers — Britain, West Germany, Denmark, Switzerland, France, Italy, Belgium, Holland, Canada, Japan, Australia. . . .

They don't put up with crippling work stoppages.

Strikes are silly, senseless, ridiculous, and uncivilized. They constitute moral retrogression to "trial by battle" and represent the bestiality of the jungle.

We, the innocent but damaged bystanders, should rise up and demand labor courts for OUR country, too. Don't you agree?

Let's become sophisticated and *civilized!*

Science is only the free cooperation of mature minds in an atmosphere of mutual respect.—DR. J. B. RHINE.

* * *

Adjustment in the sense of conformity to the peer group is never a legitimate aim of education nor, indeed, of civilization; its full achievement would mean the end of civilization. A sound education must include learning to know when one should differ from his fellow men.—PAUL WOODRING.

* * *

Plenty of men play golf religiously every Sunday.

* * *

Knowing what you want includes knowing what you will have to give up before you get it.—BENJAMIN FRANKLIN.

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'The Conscience of the Industry'

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Divergent Views on Electric Heat Aired By Panel Members at NHAW Convention

ST. LOUIS—Varied views on electric heating ranging from rather severe criticism of utilities to urging increased cooperation with utilities by the warm air heating industry were aimed at a "work shop panel session" held by Northamerican Heating & Airconditioning Wholesalers Association during its 13th annual convention here recently.

Utilities, manufacturers, and wholesalers were represented on the panel.

"Electricity, like gas and oil, is a heating medium, not a heating method," pointed out Richard Cullom, until recently with Gerwin Industries, but "electric utilities, in many instances, have not only spoken in favor of radiant heating but also in disparagement of warm air heating."

It's unwise for the utilities to ignore the strides made by the warm air industry in humidity control, electrostatic air cleaning, and summer cooling, Cullom emphasized, yet he charged the industry with the "grossest insincerity" in contributing so little to the utilities' program.

Declaring that electricity is an excellent source of energy for year-round air conditioning, S. S. Sansbury of Union Electric Co., St. Louis utility, urged manufacturers to take advantage of the "inherent advantages" of electric heat.

'Electric Rates Dropping, Other Fuels Rising'

Admitting that "on a B.t.u. for B.t.u. basis electricity is generally more expensive" as a fuel, Sansbury pointed out, however, that electric rates are dropping while the costs of other fuels are rising.

Representing Northern Illinois Gas Co., R. G. Nelson called attention to the great difference in cost between electricity and gas for heating, saying, "in general, you can heat and cool your house with gas cheaper than you can just heat it with electricity."

As for oil, Robert Barr of Jet-Heat, Inc., acknowledged that oil heating groups "by and large have been as sound asleep about doing battle with electric heat as they were 10 years ago about doing battle with gas."

In certain areas, however, he declared that active promotion of oil heat has not only slowed the growth of electric heat but gas as well.

Heat Pump Praised

The heat pump came in for considerable praise from O. U. Mutz of Peerless Corp., who emphasized "no resistance type electric heating method has the performance advantages of the heat pump."

Citing such heat pump developments as improved reversing valves, dependable de-icing controls, and high-speed compressors, Mutz declared that "perhaps the latter are the forerunners of two-speed compressors operating on low-speed for cooling and high speed for heating."

Mutz also told the wholesalers that "the day is not far away when most of your dollar sales volume will be in electric-powered heating devices."

Wholesaler Frank Green of Des Moines, who explained he had been handling electric heat items for two years, said, "we consider electric heat as just one more fuel source.

"As wholesalers I think we should voice objections to some of the promotion of electric heat, especially straight resistance heating," Green emphasized. "I think we as an industry should object to utilities who are power-mad, who want to increase their load whether they sell comfort or not."

Start-Up Ceremony

SHOWN are presidents of Michigan engineering societies who were present at the start-up ceremony for a new extension of Detroit Edison's Beacon Heating Plant. This new extension will provide an additional 50,000 lbs. of steam per hour for Edison's steam service. Kneeling is Raymond Lee, president of the Michigan chapter of American Society of Heating, Refrigerating & Air-Conditioning Engineers. Standing from left to right are Benson J. Wood, president, Detroit chapter of Michigan Society of Professional Engineers, Richard C. Austin, chairman, Detroit section of American Society of Mechanical Engineers, and William M. Dull of Central Heating Department of Detroit Edison Co.

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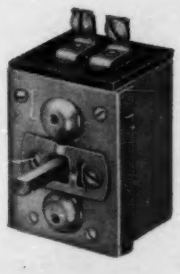
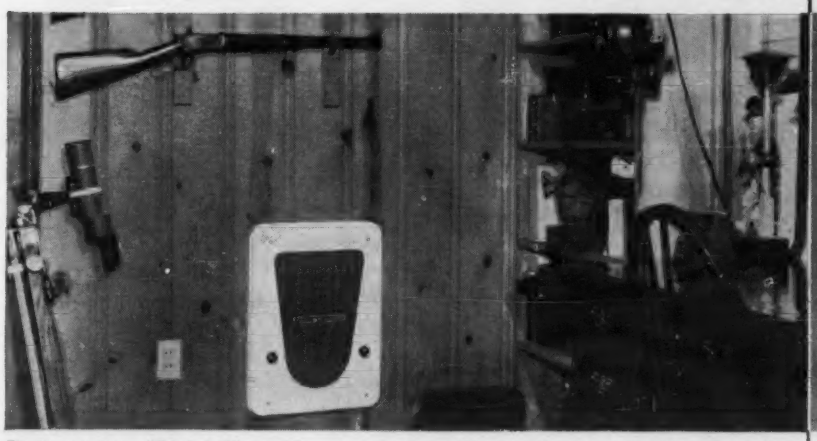


Wilcolator Type G1 single-pole, remote-bulb liquid expansion thermostat for electric heating applications



Photos courtesy of Edwin L. Wiegand Company, producer of famous Chromalox electric space heaters

Edwin L. Wiegand Company is one of several leading manufacturers of electric space heaters that have standardized on the new Wilcolator Type G1 thermostatic control. They find it offers significant advantages from both an engineering and cost standpoint.

For example, the improved snap-action switch mechanism of the G1 provides much higher contact ratings than were previously available in such a compact unit (2¾ x 1⅝ x 1⅞ in.). This permits smaller, more efficient control panel assemblies and thus helps simplify problems of flush installation.

At the same time, the G1 is generally priced lower than its bulkier counterparts—a welcome saving to the manufacturer. Equally important is its reliability—a reflection of Wilcolator's 20 years' experience in designing and producing space heater thermostats. For complete information on the G1 control, write The Wilcolator Company, 1001 Newark Ave., Elizabeth, N. J. *In Canada:* Wilcolator (Canada) Ltd., 221 Evans Ave., Toronto 14, Ont.

SPECIFICATIONS

Temperature range: 0°F min.; 585°F max. Special temperature ranges: to your requirements

Contact rating: 30 amp, 125 and 250 volts a-c noninductive load

Standard shaft: ¼ in. diam. flatted to .156 in. Length to your requirement. Special shafts available

Dials: Standard or special dials, pointers, and chrome bezels available

Terminals: Screw type, AMP or Arkles

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MANUFACTURERS OF LIQUID EXPANSION ELECTRIC THERMOSTATS FOR:

ELECTRIC RANGES • ROOM COOLERS • AIR CONDITIONERS • CLOTHES DRYERS • SPACE HEATERS • ROLL WARMERS • ROASTERS • FRYERS • STEAM TABLES • WARMING OVENS • RANGETTE OVENS • WATER HEATERS • BAKE OVENS, ETC. • STOCK WATER HEATERS • RESTAURANT APPLIANCES • VENDING EQUIPMENT • PACKAGING MACHINERY • PHOTO DRYERS • BLUEPRINT MACHINERY, ETC.

ALL WILCOLATOR THERMOSTATS ARE UL AND CSA APPROVED AND LISTED

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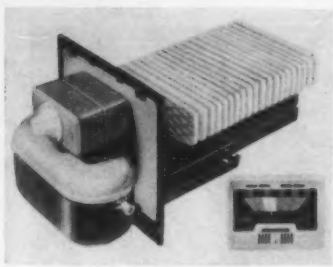
Home Unit Controls Humidification



● A new package humidification system for home use has been announced by Skuttle Mfg. Co., Dept. AH&RN, Milford, Mich.

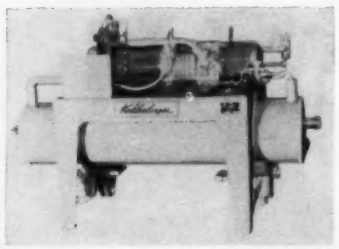
The model 900 "Cormaire" (correct moistened air) humidifier utilizes a "Vapoglas" plate humidifier with an added electric element designed to provide controlled humidification during the entire heating season.

This humidifier uses 20 Vapoglas evaporating plates in a corrosion resistant evaporating pan. A 625-watt electrical element, incased in "Cerrafelt," is placed under the evaporating pan to assure longer life and eliminate hard water deposits on the heating element.

"As a Vapoglas plate humidifier, the model 900 usually provides adequate humidity in the spring and fall in those sections of the country where the outdoor relative humidity is high," it was stated. "In some areas the Cormaire can be used as a Vapoglas plate humidifier almost 50% of the heating season. By checking the hygrometer that is furnished with the model 900, the homeowner can readily determine when he should use the Cormaire as a controlled humidifier."

As a controlled humidifier, the output of the model 900 can be increased by setting the cycling switch that controls the electric heating element. As a completely automatic humidifier, the Cormaire is placed in the plenum, and a relay transformer and humidistat are added.

Unit Dries Air for Use In Instrumentation

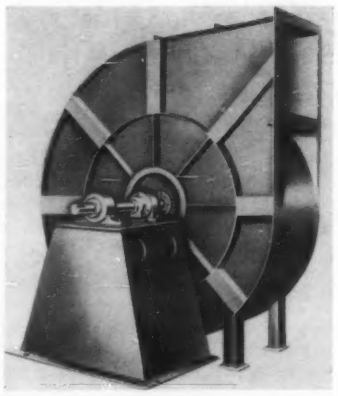


● A new industrial instrument air dryer based on the principle of sub-dewpoint refrigeration has been developed by Kohlenberger Engineering Corp., Dept. AH&RN, 1600 Commonwealth, Fullerton, Calif.

The KCD air dryer has been designed for use where clean dry air is needed for instrumentation, controls, or processes.

The air dryer is said to condense water and oil vapors from compressed air, "eliminating the need for expensive carbon-ring compressors thus allowing use of standard compressors for instrumentation purposes. The need for special desiccant drying beds, reversing valves, and auxiliary equipment has also been eliminated."

Features include a semi-hermetic type motor compressor, Refrigerant-12 cooled, which is vibration spring mounted and coupled with flex couplings to the suction and discharge lines.



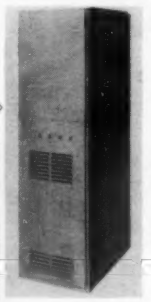
Pressure Blowers Have Airfoil Blades

● A new series of "high-efficiency, large capacity" pressure blowers equipped with airfoil blading has been announced by Westinghouse Sturtevant Div., Dept. AH&RN (T-257), 200 Readville St., Hyde Park, Boston 36, Mass.

This Series 2400 line has 8,000 to 64,000 c.f.m. at pressures from ¾ to 2¼ p.s.i.g., it was stated.

These blowers are recommended for steel mill furnaces, product cooling, etc.

"While permitting quieter operation, the airfoil blading and scientifically designed aerodynamic flow passages through wheel and housing also give optimum performance with minimum power input, frequently allowing operation of the blowers with motors smaller than necessary with conventional flat-blade blowers," the announcement said.



NEW LINE OF deluxe high c.f.m. downflow gas furnaces has been introduced by The Trane Co., Dept. AHRN, La Crosse, Wis. Line includes three models designed for use in homes where cooling requirements are comparatively larger than heating. For details, see Dec. 14 issue of NEWS, page 21.

Serrated Tips Added For Snap Ring Tool

● Something new has been added to the Milbar replaceable tip snap ring tool, according to Milbar Corp., Dept. AH&RN, 1900 Euclid Ave., Cleveland 15.

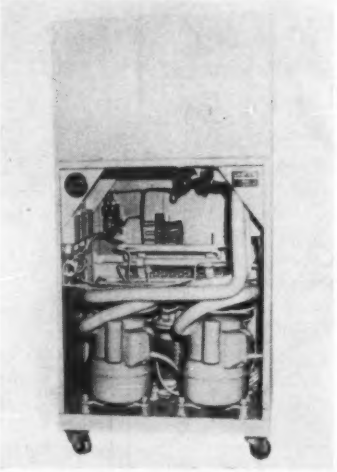
Now special serrated tips are available to handle "C," or holeless snap rings. The "C" ring tips have the same replaceable advantages of the regular straight or angled tips for use with holed snap rings, it was stated.

Remote Assembly Supplies Low Temperatures

● Portable, packaged, remote supplies of low temperatures to -120° F. are said to be provided with the utilization of a "Kold-Pak," a new line of refrigeration equipment by Tenney Engineering, Inc., Dept. AH&RN, 1090 Springfield Rd., Union, N. J.

The Kold-Pak is a one-piece, packaged, mechanical refrigeration assembly that provides low temperature mediums to any enclosure through heat exchangers that can be connected to the required flow lines, it was pointed out. Kold-Paks are either of the direct expansion type, with halogenated refrigerants passing through a user's heat exchanger, or the brine chiller type with a liquid acting as a secondary cooling agent.

There are 12 standard models with the following capacity span: At -40° F. brine temperature or -60° F. evaporator temperature, the capacity is from 3,240 to 34,000 B.t.u.h. At -100° F. brine temperature or -120° F. evaporator temperature, capacity ranges from 660 to 7,000 B.t.u.h. All intermediate capacities are available in standard models, and Kold-Paks are also built to specifications for special requirements calling for greater capacities.



Dispenser Delivers Open Center Ice Cubes

● Its new automatic ice dispensing machine features automatic making, storing, and pushbutton delivery of new type open center ice cubes, according to the Refrigeration Div., Yates-American Machine Co., Dept. AH&RN, Beloit, Wis.

"Cubes are made under water, stored in a protected air-tight compartment, and delivered in sterile protected containers," it was explained. Delivered ice cubes are as pure as the water supply . . . free from contamination.

"Small space requirement makes it possible to place it in the most strategic locations."

THE CHOICE OF LEADING
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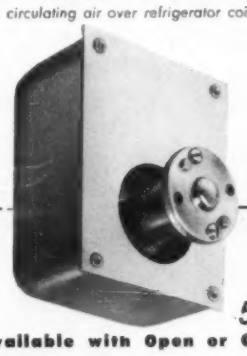
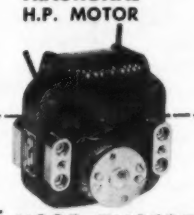
FROST-FREE REFRIGERATION

Finest motor available for circulating air over refrigerator coils to eliminate frost



HOWARD MODEL 1085
2 Pole, Unit Bearing
FRACTIONAL
H.P. MOTOR



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Available with Open or Closed Construction

MOUNTING: From rear or by special pads on front.
BEARING: Single, long-life, permanently lubricated.
STATOR: Vacuum varnish impregnated coil on molded nylon bobbin.
ROTOR: Dynamically balanced for ultra-quiet operation.
ROTATION: Unidirectional (CW or CCW as specified).
SHAFT-HUB: Assures positive and accurate location of connecting part (fan) which must run concentric. Can also be furnished with shaft extension from hub.

HP: 1/750 to 1/185
NO LOAD RPM: 3400
FULL LOAD RPM:* 2600-3200
INPUT WATTS: 8-30
VOLTS: 115 V. 60 cy. AC std.
*Lower full load speeds also available.

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7. 6 SIZES FROM 3/16" TO 5/8"
8. ALL SIZES SAME LOW PRICE
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10. TAMPER PROOF

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A life time valve designed to operate all Watsco Line Tap, Can Tap and Line Port Valves. Quick coupled—No wrenches required. Single or double port valves are available.

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FREE PARKING AND FAST COUNTER SERVICE AT THESE 4 BIG WAREHOUSES

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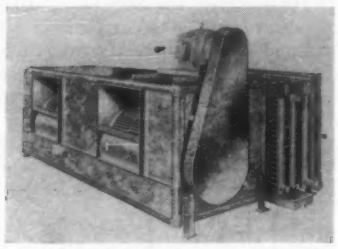


● A new series of compact, modular-design air handling units for air conditioning, ventilating or heating and ventilating have been announced by Recold Corp., Dept. AH&RN, 7250 East Slauson Ave., Los Angeles 22, Calif.

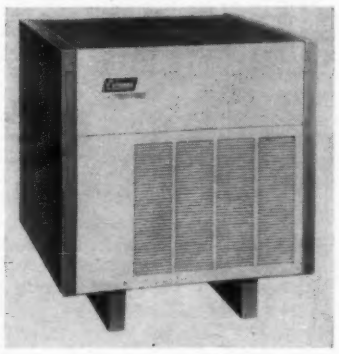
The new "AH" units are rated from 800 to 34,000 c.f.m. for direct expansion, chilled water, hot water and steam.

Features include the modular design in which the blower section is independent from the coil sections; flexible arrangements with top, bottom, or rear fan discharge; many motor and coil locations and any combination of coils and accessories, according to Recold.

Standard wheels on the units are Class I construction taking up to 3½ in. of static pressure. Class II construction for units rated at 7,000 c.f.m. and larger, are available with backward-curved wheels for up to 6 in. of static pressure. This construction includes a stronger frame, larger shafts and bearings, it was stated.

"AH" units are available with all normal accessories including flat filter sections, angular filter sections, mixing box and dampers, face and by-pass dampers, steam humidifier and insulation.

2½ Hp. Unit Added to Polar-Prince Line



● A custom condensing unit with a nominal rating of 2½ hp. has been added to the "Polar-Prince" line of remote air conditioning equipment produced by the Coleman Co., Dept. AH&RN, 250 North St. Francis, Wichita 1, Kan.

Pointing out that this model fills a specific need, the company explained that "among the most popular sizes and types of homes being built today, there are a vast number that are just a little too large for a 2-hp. air conditioning unit and too small to require a 3-hp. unit."

Models in the now complete Coleman line of Polar-Prince units are 2, 2½, 3, 4, and 5 hp.

Nylon Comb Cleans, Straightens Fins

● Introduction of its new all nylon "Fin-Comb" for straightening evaporator and condenser fins has been announced by Watso, Inc., Dept. AH&RN, 1020 E. 15th St., Hialeah, Fla.

"Fin-Comb is made to accomodate most units," the company said. "The tooth depth and slant is an engineered feature that aids in straightening stubborn fins.

"Fin-Comb may also be used for cleaning lint off the evaporator.

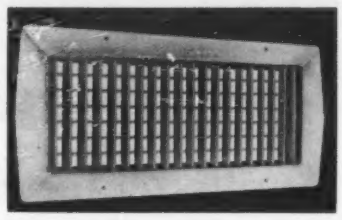
Quiet Grilles, Diffusers Molded of Nylon

● "Strong-as-steel" nylon injection molded grilles, registers, and curved blade diffusers have been introduced by AirGuide Plastics Corp., Dept. AH&RN, 20 S.E. Third Ave., Miami 32, Fla.

The company's initial entry into the air outlet field with round molded ceiling diffusers was announced early last winter. These have now also been converted to nylon.

The new line, called the Aristocrat "400" Series, will be offered at a low price range, the company said. Features include contour design and two-tone "Gray Dawn" color-styling by Morris Lapidus, A.I.D.

The manufacturer asserts that the "extraordinary 'sound barrier' characteristics of high-density nylon permits higher jet velocities without whistling or roaring 'Air-Loc' which provides permanent air-tight closure against wall or ceiling without the use of any gaskets."



Cleans Aluminum of Discoloration, Oxide

● Oxide, scale, and heat discoloration are claimed to be removed from aluminum by a one-step method with "Ox-Off #536" developed by Chemclean Products Corp., Dept. AH&RN, 15-08 121st St., College Point 56, N. Y.

The procedure may be used to clean aluminum before welding, to remove discoloration after welding, soldering, or heat treating, and to level off minor scratches and mars, according to the company.

THE MOST! – in every department

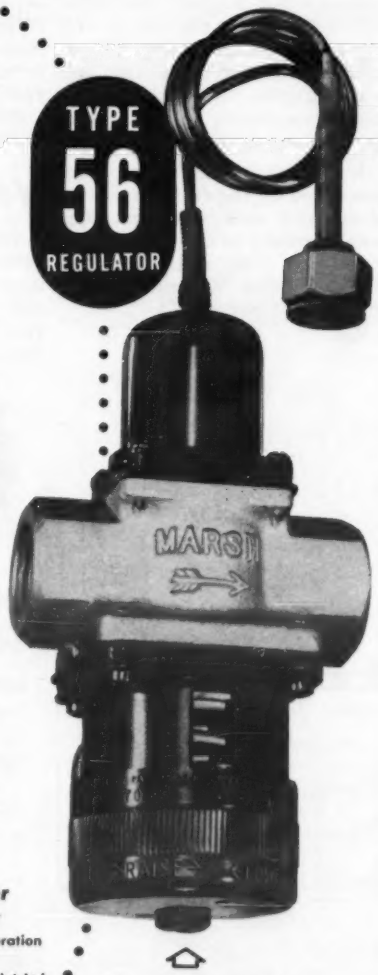
That's the verdict of men who know water valves.

They like its wide range: One valve adjustable for both R-12 and R-22 without changing springs. Simply turn the knurled cap to any setting from 60 to 270 lbs. Cap can be easily removed and the setting made tamper proof when desirable.

They like the way it fits in: Small and compact, but with ample capacity, smooth modulation, excellent flow characteristics.

They like its quality construction: Monel seat beads that minimize wire drawing; direct acting leak proof bellows. They like the provision for manual flushing after installation to remove dirt and grit. Bulletin tells the story.

TYPE 56 REGULATOR



Nut provides for tamper proof setting when this is desirable.

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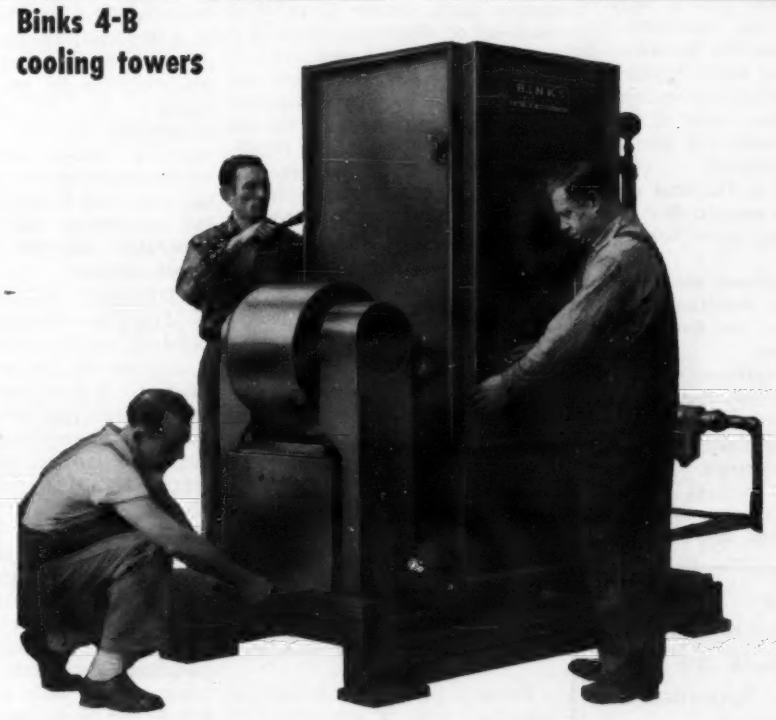
Binks 4-B cooling towers



hot-dipped
galvanized after fabrication
for years more service

Now . . . Binks adds extra years of life to an already rugged, dependable cooling tower.

New 4-B series

Now . . . blowers, tower casings, basin . . . all parts subjected to corrosive action, weather and temperature changes are hot-dipped galvanized *after they are fabricated.*

No paint . . . no other coating material offers such long-lasting positive protection. And . . . hot-dipping after fabrication insures that there is no break in this protective armor.

High performance

Season in and season out, Binks towers are always more than a match for the specified cooling load. Motors, whisper-quiet squirrel cage blowers, decking and water dispersal ratios are all properly balanced for top efficiency.

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TECH CENTER

by Frank J. Versagi, Technical Editor

Applied Electrical Theory (Part 7)

Direct & Alternating Currents

All the information so far presented in this series is valid for both direct current circuits and for alternating current circuits, the latter with resistance-type devices only on the lines. (The reason for this qualification about ac circuits will be explained in a later article.)

Most of the rest of this series, dealing with such items as transformers, power distribution, solenoids, relays, motors, will require an understanding of the distinction between ac and dc and of several basic differences in their respective behavior. Further, most of the remaining material will pertain to alternating current.

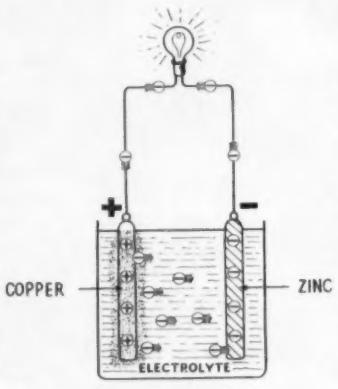
As defined in the first article, electricity is said to flow whenever electrons move through a conductor.

If the electrons always move in the same direction through the conductor, the flow is called direct current.

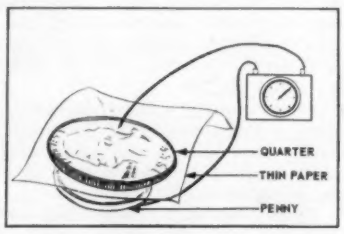
If the electrons alternately move first in one direction, then in the opposite direction through the conductor, the flow is called alternating current.

Electrical current produced by chemical action, as in a battery, is always dc. This is also true of current produced by thermocouples. Either alternating or direct current may be obtained from the mechanical action of steam or hydroelectric turbines.

CHEMICAL GENERATORS: Place both a strip of copper and a strip of zinc into an acid solution. Bubbles of gas forming on the zinc will indicate that a chemical reaction is taking place. During the reaction, electrons will build up on the zinc strip and an electron deficiency will simultaneously occur on the copper strip. Since there is a build-up of electrons, there is a potential source of emf. And, if the zinc and copper strips are coupled with a wire, electrons will flow from the zinc to the copper. This current can be detected with a **galvonometer,** a sensitive ammeter, or—in a larger cell—it can be made to light a lamp.

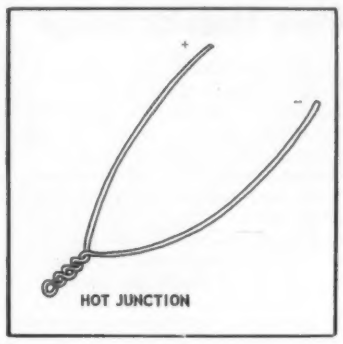


Press a penny and a quarter together, with a dry sheet of paper between them and with a wire running from each to a galvonometer. No current will be indicated. Moisten the paper with orange juice, vinegar, saliva—with any liquid which can act as an electrolyte—and current will flow, deflecting the meter.



The electrolyte, or current carrying fluid, can be a paste as in a dry cell; the zinc and copper may be replaced with other materials as in an automobile battery. But in all chemical generators of emf, a chemical reaction takes place during which electrons are released. All the electrons build up on one of the materials and **chemically generated current is always direct current.**

THERMAL GENERATORS: The familiar thermocouple is a practical application of the electricity which can be generated by heat. It is a fact of nature that when two wires of dissimilar materials are joined together at one end, and the junction is heated, a voltage is developed between the open ends of the wire. The build-up of electrons is proportional to the temperature difference between the **hot junction** and the open ends—a fact which makes it possible to connect the **cold junction** (loose ends) to an electrical meter with a scale calibrated for temperature measurement. As in chemical generation, **electron flow in a given thermocouple is always in the same direction—direct current.**



Because electrons flow always in the same direction in dc, most direct current devices must be clearly marked for positive (+) or negative (—) connections, since a reversal of leads can cause either malfunction or reverse operation, depending on design.

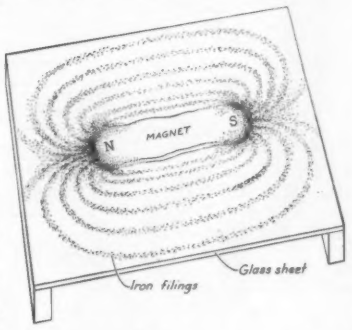
MECHANICAL - MAGNETIC GENERATION: If a few turns of copper wire, with ends attached to a zero-center galvonometer, are pushed up around a bar magnet, the meter will deflect. Stop the coil at any position and the meter reads zero. Sharply remove the coil from around the magnet and the galvonometer will deflect in the opposite direction.

It is obvious that emf is being generated by the relative motion of the coil near a magnet. The results would be the same if the coil were held stationary and the magnet were thrust into it, then pulled out.

Notice that the current flows first in one direction then in the other, as the movement of the conductor is reversed. This change of direction, if caused to occur regularly by some means, generates alternating current. Unlike the case in chemical or thermal generation of electricity, the electrons may be made to flow in either direction through a conductor.

The phenomenon is fundamental to all practical power generation: **When an electrical conductor cuts through a magnetic field, an electromotive force is set up between the ends of the conductor.**

You may recall from your study of physics that every magnet is surrounded by a **field of force.** The classic experiment to show this is to bring a bar magnet up under a sheet of paper or glass containing iron filings. The filings will align themselves in the directions of the lines of force which leave one end of the magnet and return to the other.



Electromotive force set up by relative motion of a conductor through these lines of force is called an **induced emf.** The current which flows through such a conductor is an **induced current.**

Next: AC and DC GENERATORS.

Warren G. Jennings Dies

HYANNIS, Mass.—Warren G. Jennings, 73, retired vice president of the Minneapolis-Honeywell Regulator Co., died here recently following a lengthy illness.

Looking for a Business to Buy . . . ?
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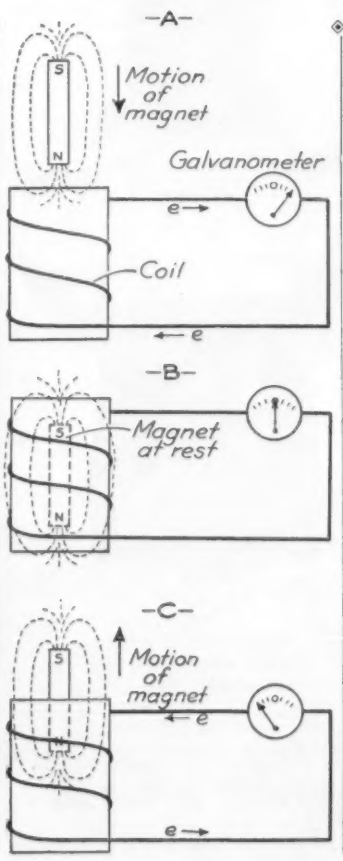

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Refrigeration Problems
And Their Solution
(*As Written by Paul Reed*)

Problems with a Capillary Tube

The only thing that a refrigerating system does is to remove heat and thus produce refrigeration. It may also be used to control humidities, but this is incidental to and a result of its main function. More accurately the refrigerating system moves heat from one place (the evaporator) and puts it some other place (mainly the compressor head and the condenser). In between these two extremes of temperature—the cold evaporator and the hot condenser—there are gradations of temperature in the lines, receiver, controls, etc.

Although it is the temperature of the cold evaporator that we are mainly interested in, we should be familiar with the normal and abnormal temperatures of the other parts of the system, for they are clear indications of how effectively and how efficiently the system is operating. If properly understood and used, they are revealing symptoms of what may be wrong with a system that is not operating properly.

An experienced service engineer, who understands the processes that are going on inside the refrigerating system, can often learn a great deal about how well a system is operating and what is wrong with it just by feeling the different parts of the system with his hand, although he can determine much more accurately by using thermometers. Nor is feeling the temperatures of parts of the system an effective substitute for gauges to determine the pressures, but even the temperatures as determined by feel often make an effective, quick, preliminary survey of the situation, that can save a lot of time.

FREEZER PROBLEM

For example, a service engineer is called on a freezer using a capillary tube system. He feels the food and finds it beginning to get soft, especially the ice cream and the frozen strawberries. He puts a thermometer in contact with the foods and finds the temperature up to an average of about 12° F.

He feels the suction line leaving the evaporator and finds it rather warm—warmer than it should be, even considering that there is a heat exchanger between the evaporator and where he felt the suction line. From this, he at once knows that the evaporator is not being fully fed with refrigerant.

At this stage it is not necessary, but if he wished to do so he could clip a thermometer on each side of the heat exchanger. Between the heat exchanger and the evaporator the thermometer should read about -5° or lower; with a temperature rise of perhaps 15° to 20° through the heat exchanger, depending on its size and type.

He feels the compressor head and the top of the condenser; neither are as hot as they should normally be, showing that the compressor is not pumping its normal amount of gas. He feels the liquid line just beyond the outlet of the condenser and finds it warmer than it should be, indicating that hot gas from the condenser is getting into the liquid line.

All of these checks, just by "feel," point to lack of charge in the system. Then he puts on the gauges and finds the suction pressure and the discharge pressure both abnormally low. This confirms his preliminary diagnosis by feeling the temperature of the lines, compressor, and condenser. The system is low on charge.

LEAK HAS DEVELOPED

The freezer had been holding a good temperature of about zero to -5° until recently, so he can be sure that a leak has developed somewhere in the system, and his job is to find it. It would be no use to simply add a few ounces of refrigerant. That might get by on an expansion valve system, where he could add enough reserve to run the job for a while, despite the leak.

But a cap tube system has a "balanced charge." He might be able to add a few ounces of refrigerant—probably not over a half pound—but within a day or so, or a few days at most, there would be another call. So he has to find the leak and repair it; then add enough refrigerant to get the exact charge in the system. This would be indicated when there was a frost line just out of the cabinet when the machine stops after a normal run, and with the thermostat satisfied.

Under these normal running conditions, the head pressure would be that pressure corresponding to the room temperature plus about 35°. The suction pressure would first rise abnormally high to correspond to the warm evaporator, and then go down to about 0° gauge, the exact amount depending upon the design of the make of freezer.

The compressor head should be hot and so should the top of the condenser. On cap tube systems, the liquid line and the suction line are soldered together for a part of their lengths, but that portion of the liquid line between the condenser and where the suction line joins it, should normally be at very little above room temperature.

ANOTHER SIMILAR FREEZER

On another freezer also using a cap tube system, he found similar conditions; the food a little soft and the suction line leaving the evaporator rather warm, again indicating that the evaporator was not being fully fed with refrigerant. To his hand the compressor head and condenser felt warmer—almost normal. The liquid line leaving the condenser also felt about normal, thus indicating that it had no hot gas in it from the condenser. This was a preliminary indication that the system had enough charge in it.

However, the liquid line had a strainer in it. He felt of it and the strainer and the liquid line beyond—that is, down stream—felt quite cool, much cooler than the liquid line ahead of the strainer. This caused him to suspect that there was a partial stoppage in the strainer.

He clipped a thermometer to the liquid line a few inches ahead of the strainer and another to the liquid line just beyond the strainer, and they showed temperatures of 93° and 62, respectively, a difference of 31°. This was too much; he would have disregarded a temperature difference of 5° or less, as indicating a normal pressure drop through the strainer.

This was a clear indication of partial stoppage in the strainer. To further check, he put on the gauges. The discharge gauge read 140 pounds per square inch (p.s.i.) which was about normal for the 75° temperature. The suction gauge read 9 in. vacuum; whereas, normal for that freezer would have been about a pound or so.

The gauge readings confirmed his preliminary diagnosis arrived at from the "feel" of the temperatures of the lines, compressor, and condenser. He then felt certain that the trouble on this second

(Concluded on next page)

NEW SUNISO REFRIGERATION OILS

TWO NEW OILS

IMPROVED SUNISO 3G is a new version of the famous all-around Suniso 3G—but now has greater stability and lower floc point.

NEW DUAL INHIBITED SUNISO 3G has two added inhibitors and gives unusually fine performance at extremely high temperatures.

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Both Suniso oils offer unusually high stability, even at high head temperatures. Their resistance to oxidation and their long life are important in effective equipment maintenance. Carbon residue is held to a minimum, and viscosity does not increase perceptibly.

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The inhibitors in New Dual Inhibited Suniso 3G increase stability and copper-plating resistance *to a degree never before possible.* They virtually eliminate the problems of oil varnishes and sludges.

NEW LOW FLOC POINT

Both Suniso oils now have a floc point of −70° to −80°F. This enables compressor manufacturers to take full advantage of the low evaporation temperature (−40°F) of Refrigerant 22 without danger of plugups. And both oils are more compatible with refrigerants than ever before.

EXHAUSTIVELY TESTED

Both oils were tested in the laboratories of several well-known compressor manufacturers for high speed, full load, and continuous service operation. These extremely severe tests resulted in "Approval without any qualifications" in each case.

For the customer with standard, well-functioning equipment, Improved Suniso 3G gives excellent results. The customer with equipment problems—where other oils fail to combat copper plating, wet system—should use New Dual Inhibited Suniso 3G.

Suniso is distributed nationally by Refrigeration Division, VIRGINIA SMELTING COMPANY, 155 Jefferson St., West Norfolk, Va.

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Available in Canada and many other countries

Capillary Tube--

(Concluded from preceding page)

freezer was due to the partial stoppage of the strainer, so he pumped the job down and removed the strainer. However, before removing the strainer he broke the vacuum back up a couple of pounds above zero gauge, so that when he opened the liquid line he would not get moisture into the system.

Although there had been no indication of moisture, he replaced the strainer with a small combination drier-strainer, just to be sure to catch any moisture that he might have let into the system when he opened it, or moisture that might have come out of the evaporator due to its being warmed up somewhat.

In changing the strainer he had lost a little charge, so he added about a quarter or half pound by guess, put on a recording suction pressure gauge, and went on some other calls. A few hours later he came back, found the job had pulled down and had been cycling.

However, the frost was coming out a little too far on the suction line at the end of a running period, showing that he had added a little too much refrigerant. He purged some out until frost just showed on the suction line outside the cabinet.

That night, back in his shop, he cut the old strainer open to see what was in it. He found the inlet side of the strainer pad was covered with a gritty, dark brownish powder that seemed to be just ordinary dirt. If the strainer had not caught it, this dirt would probably have stopped up the capillary tube.

SYMPTOMS OF A STOPPED CAPILLARY TUBE

Suppose that on this second freezer, the service engineer had found the conditions about the same as previously described, but with no perceptible pressure drop in the strainer as indicated by the temperature drop across the strainer; but with the compressor head and condenser much cooler than normal, indicating that the compressor was pumping very little gas.

Moreover, under these conditions, the gauges showed only 96 p.s.i.g. head pressure and a 22-in. vacuum on the low side. These symptoms would definitely indicate that the capillary tube itself was stopped up, either from dirt or other foreign matter, or from moisture.

In such a case he probably would have tried to warm up the capillary tube and blow back through it to open it. If he were successful in clearing it, he would have put on a new strainer-drier in the liquid line just ahead of the capillary tube to prevent a repetition of the stoppage, rechecked the charge, etc.

If he were not successful in clearing the capillary tube, obviously he would have had to replace the capillary tube.

'Golden Sixties' Forecast for Industry, Country

DETROIT—Almost everybody is predicting good things for the sixties, "the golden '60's" is the colorfully optimistic term being applied to them.

Major companies in the heating-cooling industry and both gas and electric utilities share this rather universal optimism and are looking forward to even better times from what, for most, was a very good 1959.

William P. Von Behren, general manager of General Electric's Major Appliance Div., sets the mood: "All the indicators are for expanding markets."

In agreement are forecasts and predictions covering the entire economy. Releases from the Dept. of Commerce, from banking, commercial, and industrial interests, from service industries all stress that sales volume will increase in 1960 and during the next decade.

From some quarters, the enthusiasm carries into predictions of new things as well as more of the same things. Thermoelectric products are forecast, as are new heating-cooling devices for special purposes. The usual predictions of electronically-operated kitchens and houses are offered.

While a few sources are less enthusiastic, the difference is in degree, rather than kind.

General Manager Herman F. Lehman of Frigidaire, for example, says, "Looking ahead conservatively, we expect 1960 appliance sales to continue at about the same level as 1959, which for us was our second biggest year, exceeded only by 1955."

Reviewing the fifties, Lehman pointed out, among other things, that the room air conditioner "made its mark with sales rising from about 86,500 in 1949 to better than 1.5 million in '59." Speaking of Frigidaire, the general manager stated that production had not been affected by the steel strike—"our employment, which exceeds 16,000, rose slightly during the year."

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Heavy Equipment Outlook

Officials of **Carrier Corp.'s** Machinery & Systems Div. reported 1959 sales showed "substantial improvement over 1958" and said that a 5 to 10% increase in '60 is a good possibility.

York Div. of Borg-Warner Corp. "experienced a continuation of the growth which has been typical of their sales in the 'heavy' air conditioning and refrigeration field," stated Henry M. Haase, York president.

"Engineered Machinery sales hit a record high in '59, and '60 will exceed '59 by an even greater margin than '59 surpassed 1958. I believe we are being conservative, barring a resumption of the steel strike, in forecasting our '60 sales will be 20% greater than last year," Haase said.

He added that the division expects the heat pump to become a leading source of year-round conditioning during the next decade.

The York executive also predicted continuing growth for the company's centrifugal and absorption systems and stated that 1960 will mark the entry of York into central station air handling equipment. A new line of packaged water chillers will also be introduced, Haase stated.

At Worthington Corp., "1959 resulted in a more than 50% increase in bookings over '58 and the upward trend is expected to continue in 1960," according to A. J. Hackl, general manager of the Air Conditioning & Refrigeration Div. to which the figures apply.

Simultaneously, P. A. McLeod, newly-appointed field sales manager, announced product line extension for 1960: expansion of the larger self-contained package units beyond the 20, 25, and 30-ton units introduced in '59; extension of air-cooled condensing units, matching blower coil units, new sizes of central station multi-zone units; increased sizes in the new Worthington V-line compressors.

Residential

Carrier predicts a steady and substantial growth in complete home air conditioning in the next decade. Company studies indicate that by 1965, more than 300,000 homes per year will be installing air conditioning systems to serve the entire house.

The Carrier statement estimates that $300 million worth of home air conditioning equipment was sold in 1959, and its Syracuse-located Unitary Equipment Div. sold more residential systems during '59 than ever before in its history.

Room Units

Room air conditioners are among the major items for which major sales expansion is predicted by **B. A. Chapman, executive vice president and general manager of the appliance division (Kelvinator) of American Motors Corp.** Chapman based his sales outlook on opportunities for replacement and "increased saturation and in the market created by new family formations in a decade which will see millions of children born during the high birth-rate '40's come of age."

●

Electric and Gas Utilities Optimistic

Both the electrical and gas industries share in the enthusiasm which looks forward to the golden sixties. One prediction for the electrical industry is that total energy sales over the next decade will increase by 120%. Gas appliance and equipment manufacturers expect sales of most of their products will be as good or better in 1960 as they were in '59 when all-time records were set for many products.

The electric utilities added 1.3 million customers to their lines in '59, bringing the total to 57.5 million. The gas industry's househeating customers rose almost 7% in 1959 to 20.4 million; the number is expected to reach 21 million in 1960, 33 million by 1969.

"The number of gas refrigerator manufacturers increased to three in '59 and a fourth will market gas models in '60," states an American Gas Association report. Current manufacturers are Norco, Inc., Kirk Industries, and the Whirlpool Corp. The newcomer will be Borg-Warner's Norge Sales Corp. The gas industry is also pinning hope on newly-developed and improved gas air conditioners which will be discussed in a future issue of the NEWS.

This increase in the use of heating and cooling units and of complex appliances in general bodes well for the control industry, and Robertshaw-Fulton, which recently took on manufacture of the free-piston compressor for gas air conditioning, sees the need for control systems in the home for easy and reliable operation of the new appliances.

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Thermoelectric Refrigeration

As would be expected, comments were offered on thermoelectric refrigeration which was given so much attention in 1959. While there are a few who see the principle being applied to consumer products soon, most feel it will be at least the mid-sixties, while others feel that practical products are still more than a decade away. "Anything can be accomplished in a laboratory," stated one company executive, "but producing them on a mass production basis, at a reasonable price, to operate at a reasonable cost is quite another thing."

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Commercial Refrigeration

Commercial refrigeration stands to benefit by the optimism shown by members of the National Association of Retail Grocers of the United States. According to a NARGUS survey, its members, alone, plan to open 10,573 new stores in 1960, at the same time expanding 9,912 of their present establishments. "Merchandising, expansion, and mechanization," are among the important factors to be stressed in procuring greater profits from the coming expansion of consumer demand.

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Automotive Air Conditioning

Automotive air conditioning seems destined to continue its rapid growth. **Lawrence A. Zwicker, general manager of Harrison Radiator Div., General Motors Corp.,** showed a 45% increase in auto air conditioner production in '59 over the preceding year. "During the present model year," Zwicker predicted, "we hope to sell 350,000; 450,000 in 1961, and 600,000 Harrison-built units in 1962."

Simplest, most economical way to detect moisture in your refrigerant systems!

Positive Sealing
LIQUID EYE® INDICATOR
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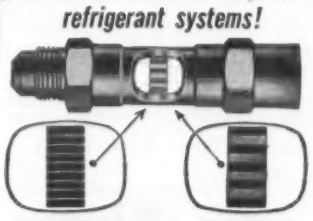
MOISTURE-REACTOR



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IT'S GOOD The MOISTURE-REACTOR is composed of alternate, permanent and changing (Reactor) color bars. When all the bars appear the same color (green)—it's good—there's no moisture in system.

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AT ALL LEADING JOBBERS

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Thermoelectric Units Still In Future, But 'Future' Is Nearly Here, RSES Told

ATLANTIC CITY, N. J.—Large thermoelectric appliances like refrigerators and room air conditioners "are still in the future, but the future was never so near as it is now," Royal S. Buchanan of Westinghouse told the Refrigeration Service Engineers Society at its 22nd annual convention here.

There are practical and economic problems, however, explained Buchanan, who is manager of advance development for the Westinghouse appliance division's refrigerator-freezer engineering department.

Although thermoelectricity was first discovered in 1821 by Seebeck, "who even discovered semi-conductors but didn't realize it," Buchanan explained that it was the recent rediscovery and further development of semi-conductors that has greatly renewed interest in thermoelectricity.

Thermoelectric materials have been greatly improved to the point where the efficiency of such a refrigerator can be better now than the absorption cycle and equal to the compression cycle under some circumstances, according to Buchanan.

"In a household size refrigerator, though, the chief advantage of a thermoelectric system now would be lack of noise," he said.

In both theory and practice the thermoelectric principle can be employed to make an electric heat pump whereby reversing the flow of current through the semi-conductor materials produces either heating or cooling, Buchanan noted.

This has been applied in a small appliance which provides refrigeration for storing a baby bottle at 40° F. and then is switched automatically by a clock to the heating cycling, warming the bottle and "formula" to 100° F., he explained.

At this point an alarm sounds to note that the bottle is ready and also, if necessary, to wake up the baby and/or parent.

Other illustrations of possible household applications included a serving "cart" combining a small refrigerator and small warming oven, and a small dehumidifier designed for the cupboard to keep crackers, etc., dry.

Commenting on possible service problems with thermoelectric systems, Buchanan said they may differ from conventional refrigeration units, but there'll be "no unusual problems you couldn't repair with the usual tools."

As for design, "there's the old problem of heat exchangers," but interesting possibilities are presented for controls, he indicated.

With a thermoelectric system there need be no on-off cycling, according to Buchanan. Instead, the system could be modulated exactly to meet the load, permitting control as close as 1/10°, and also avoiding the problem of starting surge, he pointed out.

Much development remains to be done regarding power supply for such systems, though, Buchanan added. Direct current must be used, and while the voltage requirements are low, current needed is high.

No. Calif. RACCA Convention Set For Jan. 15-16

SAN FRANCISCO — General Chairman Ray Winther has announced that Executive Vice President Arthur Biddle, Hussmann Refrigeration, and Walter L. Hilton, western sales manager for Recold Corp., will give addresses at the third annual convention of Refrigeration & Air Conditioning Contractors Association of Northern California Jan. 15-16.

All sessions will be held in Santa Rosa, 55 miles north of San Francisco, at the Flamingo hotel.

James A. Scatena, national director, will talk on RACCA activities during the first Saturday morning session.

Hilton's subject is "The Contractor — Our Best Customer" during the second morning session.

At that time John W. Ward of Edward B. Ward & Co., San Francisco Carrier distributor, will speak on "The True Distributor-Contractor Function."

Henry B. Ely, executive secretary of RACCA of Southern California, will report on the Construction Industry Legislative Council of California.

Hubert J. Soher of San Francisco, economic consultant, will speak following the luncheon.

With Ray Winther as moderator, a panel discussion will fill the first afternoon session. The panel speakers and their subjects:

Robert Mowat of John Mowat Refrigerators, San Francisco, on "Supermarkets Sold By the Contractor."

A. L. Hanson of Los Angeles, president of National Refrigeration Mfg., on "Service By the Contractor."

Ralph P. Wetzel of Thermo Refrigeration, San Francisco, on "Warranties (5 years—1 year—90 days) By the Contractor."

James Scatena of Scatena York Co., San Francisco, on "Direct Sales — Where Is the Contractor?"

Questions and discussion will follow the panel speeches.

After a coffee break, Arthur Biddle speaks during the second afternoon session on "The Manufacturer Looks to the Contractor." Ray Winther will speak on the subject "Help Yourself, Mr. Contractor."

Evening social events include a dinner and presentation of 1960 officers and directors by 1959 President Kenneth Zappettini.

Warm Air Furnace Replacement Market Steady--Commerce Dept.

WASHINGTON, D. C. — Although the likely decrease in housing starts for 1960 is a negative factor, the increase in the replacement and modernization market is a saving influence for the warm air furnace industry, according to a report by the U. S. Dept. of Commerce. This replacement market is now estimated to be close to 50% of the total furnace sales.

According to the government department, replacement and modernization purchases of furnaces are affected by the state of the general economy and the availability of disposable personal income, and the implication is that these may remain high in the face of a declining construction period.

SHIPMENTS OF WARM AIR FURNACES (in thousands of units) FOR 1950-1960

Year	Total	Forced Air	Gravity
1950	1,100	839	261
1951	871	665	206
1952	927	765	162
1953	996	863	133
1954	1,152	1,034	118
1955	1,406	1,307	99
1956	1,355	1,272	83
1957	1,131	1,068	63
1958	1,248	1,188	60
1959	1,414	1,358	56
1960	1,347	1,294	53

An estimated 1,414,000 units were shipped in 1959, the report states. As of Sept. 30, 1959, manufacturers' inventories included 157,368 forced warm air furnaces and 11,365 gravity furnaces. On the basis of 1958 shipments, this inventory represents about a 30-day stock.

In the face of the anticipated decline in housing starts, the Dept. of Commerce predicts that the general state of the economy is such that warm air and gravity furnace sales to the modernization and replacement market should at least equal those of '59.

While the gravity furnace is declining and is used chiefly where no electric service is available, it is felt the unit will hold its present 4% of the total sales for a while.

An increased use of warm air heating in schools is predicted, and the general outlook for 1960 is a slight decline from 1959's 1,414,000 to 1,347,000.

OHI Press Party To Kick Off 1960 Diamond Jubilee

NEW YORK CITY—The Oil Heat Institute of America will hold a "Diamond Jubilee" reception for the press in the East Ballroom of the Hotel Commodore here, on Thursday, Jan. 28, at 4:30 to 6 p.m., it was announced by Fred Heaney, president of the Oil Heat Institute of America.

The press party will serve to "kick off" 1960 as Oil Heat's Diamond Jubilee Year.

Guests at the party will include Oil Heat Diamond Jubilee Coordinators from throughout the United States. These coordinators will be arranging suitable Oil Heat Diamond Jubilee celebrations in their own localities.

The Diamond Jubilee celebration will be climaxed at the 38th annual convention of the OHI and the 23rd National Oil Heat and Air Conditioning Exposition, to be held concurrently April 3 to 7, 1960 in New York City at the Park-Sheraton hotel and the New York Coliseum.

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REVIEW of VACUUM for SERVICE ENGINEERS by Saunders & Williams

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SUCTION ACCUMULATOR

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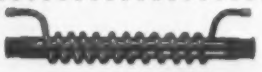
Easily and quickly installed in the suction line just ahead of the compressor, the Suction Accumulator *meters* refrigerant and oil back to the compressor at a controlled rate.....even though several pounds of refrigerant may suddenly return through the suction line.....compressors go to work quietly and safely.

Construction of the Suction Accumulator is such that it cannot trap oil and tends to act as a suction muffler to prevent transmission of suction noise.

Just two sizes cover ½ through 7½ H.P. range!



Blue Ribbon Heat Exchangers
Available in sizes from 1/4 through 10 h.p. these competitively priced heat exchangers have parallel fittings sized to match refrigerant lines of standard units.

Bull Dog Filter-Driers
These low cost, quality driers feature progressive filtering.....retain a maximum amount of dirt without pressure drop or plugging up. Available in either Molecular Sieve or Silica Gel desiccant.

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Height: 6½"
Weight: 5 oz.
Chargers: 49¢ per box of 2
Price: $8.95

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ARI's Report On Unitary Air Conditioners

ARI UNITARY AIR-CONDITIONER SECTION'S CONDENSED SUMMARY BY SIZE OF MANUFACTURERS' SHIPMENTS

THIRD QUARTER (July-September, 1959)

Size	—By Condenser-Type— Air or Evaporatively Cooled	Water Cooled	Total Units	% Change from 1958
Under 27,000 B.t.u./hr.	12,116	195	12,311	+ 75
27,000-32,999 B.t.u./hr.	4,882	390	5,272	+ 56
33,000-41,999 B.t.u./hr.	22,226	3,017	25,243	+ 75
42,000-53,999 Bt.u./hr.	6,978	379	7,357	+144
54,000-64,999 B.t.u./hr.	7,684	2,952	10,636	+ 25
65,000-96,999 B.t.u./hr.	4,273	2,041	6,314	+ 68
97,000-134,999 B.t.u./hr.	1,422	1,933	3,355	+ 74
135,000-184,999 B.t.u./hr.	500	998	1,498	+ 66
185,000-249,999 B.t.u./hr.	418	395	813	+ 79
250,000-319,999 B.t.u./hr.	49	325	374	+ 13
320,000-379,999 B.t.u./hr.	57	307	364	+ 77
380,000 B.t.u./hr. & over	26	90	116	+127
Total	**60,631**	**13,022**	**73,653**	**+ 67**

This condensed summary by size includes shipments of:

1. Air Conditioners (except window and wall types) With or without condensers and refrigeration chassis.
2. Year-Round Air Conditioners—With or without condensers.
3. Heat Pumps (except room air conditioners). Self-contained and other than self-contained.
4. Split Systems—Air Conditioning Condensing Units **only.** It does **not** include shipments of air conditioning coils with or without blowers.

EXPORT SHIPMENTS—The total figure includes export shipments of 2,547 units for the third quarter.

* * *

Reporting Companies: Airtemp Div., Chrysler Corp.; Amana Refrigeration, Inc.; American Furnace Co.; American-Standard Air Conditioning Div.; American-Standard Industrial Div.; Arkla Air Conditioning Corp.; Armstrong Furnace Co.; Carrier Corp.; Cleveland Steel Products Corp.; Cobell Industries, Inc.; Coleman Co., Inc.; Columbia Specialty Co., Inc.; Continental Mfg. Co.; Coolerator Div., McGraw-Edison Co.; Curtis Mfg. Co.

Fedders Corp.; Florida Warren Corp.; Forston Co.; Fraser & Johnston Co.; Frick Co., Inc.; Friedrich Refrigerators, Inc.; Frigidaire Div., General Motors Corp.; Gaffers & Sattler Div., Utility Appliance Corp.; General Electric Co.; Grove Furnace Co., Inc.; Hall-Neal Furnace Co.; Heat-X, Inc.; Heil-Quaker Corp.; Holly-General Co.; Gibson Refrigerator Co.; Perfection Industries; Typhoon Air Conditioning Co., Typhoon Heat Pump Co., divisions of Hupp Corp.

International Heater Co.; Iron Fireman Mfg. Co.; Janitrol Heating & Air Conditioning Div., Surface Combustion Corp.; Lennox Industries, Inc.; Majestic Co., Inc.; Mathes Co.; Miami Products, Inc.; Mueller Climatrol Div. of Worthington Corp.; National Thermatic Corp.; National-U.S. Radiator Corp.; C. A. Olsen Mfg. Co.; Peerless Corp.; Philco Corp.; Rheem Mfg. Co.

A. O. Smith Corp.; Southwest Mfg. Co.; Stewart-Warner Corp., U. S. Machine Div.; Thatcher Furnace Co.; Therm-Air Mfg. Co.; Trane Co.; Tuck-Aire Furnace Co.; United States Air Conditioning Corp.; Westinghouse Electric Corp.; Whirlpool Corp.; Williamson Co.; Worthington Corp.; York Div. of Borg-Warner Corp.

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NEWS' CLASSIFIED ADS

ARI Unitary Air-Conditioner Section's Report Of Manufacturers Shipments January-September, 1959 (9 months)

Description of Product		Total Shipments In Units (By Condenser-type) Air or Evaporatively Cooled	Water Cooled	Total	% Change from 1958
AIR CONDITIONERS (except window and wall type)					
SELF-CONTAINED (Integral-Condenser Type) (1)	**Horizontal**				
	Under 27,000 B.t.u./hr	15,343	14	15,357	+ 6
	27,000-32,999 B.t.u./hr.	1,446	1	1,447	
	33,000-41,999 B.t.u./hr.	14,718	209	14,927	+ 53
	42,000-53,999 B.t.u./hr	1,874	1	1,875	+1412
	54,000-64,999 B.t.u./hr	403	514	917	— 2
	65,000-96,999 B.t.u./hr				
	Other Than Horizontal				
	Under 27,000 B.t.u./hr.	4	252	256	— 77
	27,000-32,999 B.t.u./hr	....			
	33,000-41,999 B.t.u./hr	6	5,298	5,304	
No. of Companies	42,000-53,999 B.t.u./hr	39	7,050	7,089	— 8
1959 — 49	54,000-64,999 B.t.u./hr				
1958 — 43	65,000-96,999 B.t.u./hr	9	6,270	6,279	+ 3
	ALL				
	97,000-134,999 B.t.u./hr.	48	5,698	5,746	— 3
	135,000-184,999 B.t.u./hr.	55	3,219	3,274	0
	185,000-249,999 B.t.u./hr	55	1,514	1,569	— 18
	250,000-319,999 B.t.u./hr	15	1,187	1,202	+ 17
	320,000-379,999 B.t.u./hr	14	790	804	+ 69
	380,000 B.t.u./hr & over	52	184	236	+ 67
	Total	**34,081**	**32,201**	**66,282**	**+ 10**
REMOTE-CONDENSER TYPE (2)	Under 27,000 B.t.u./hr				
	27,000-32,999 B.t.u./hr	962		962	— 28
	33,000-41,999 B.t.u./hr				
	42,000-53,999 B.t.u./hr				
	54,000-64,999 B.t.u./hr	679		679	— 36
	65,000-96,999 B.t.u./hr	1,208		1,208	+ 35
	97,000-134,999 B.t.u./hr	748		748	+ 32
No. of Companies	135,000-184,999 B.t.u./hr	636		636	
1959 — 14	185,000-249,999 B.t.u./hr.	238		238	
1958 — 19	250,000-319,999 B.t.u./hr	97		97	+235
	320,000-379,999 B.t.u./hr.	111		111	
	380,000 B.t.u./hr & over				
	Total	**4,679**	....	**4,679**	**+ 12**
REFRIGERATION CHASSIS (except shipments to other manufacturers) (3)	Under 27,000 B.t.u./hr	562	382	944	— 39
	27,000-32,999 B.t.u./hr	....			
	33,000-41,999 B.t.u./hr.	92	424	516	— 49
	42,000-53,999 B.t.u./hr	....			
	54,000-64,999 B.t.u./hr.	....			
No. of Companies	65,000-96,999 B.t.u./hr.	....	479	479	— 11
1959 — 10	97,000 B.t.u./hr. & over	....			
1958 — 13	**Total**	**654**	**1,285**	**1,939**	**— 37**
YEAR-ROUND AIR CONDITIONERS (except heat pumps)					
SELF-CONTAINED AND REMOTE-CONDENSER TYPE (4)	Under 27,000 B.t.u./hr.				
	27,000-32,999 B.t.u./hr	....	....	....	....
	33,000-41,999 B.t.u./hr.		9,215		
	42,000-53,999 B.t.u./hr.	419		9,634	+ 11
	54,000-64,999 B.t.u./hr.				
No. of Companies	65,000-96,999 B.t.u./hr				
1959 — 9	97,000 B.t.u./hr. & over		....		
1958 — 10	**Total**	**419**	**9,215**	**9,634**	**+ 11**
HEAT PUMPS (except room air conditioners)					
SELF-CONTAINED (5)	Under 27,000 B.t.u./hr.	6,102		6,102	+279
	27,000-32,999 B.t.u./hr.	1,025		1,025	
	33,000-41,999 B.t.u./hr.	7,529		7,529	
No. of Companies	42,000-53,999 B.t.u./hr.	898		898	+ 64
1959 — 19	54,000-64,999 B.t.u./hr.				
1958 — 16	65,000-96,999 B.t.u./hr.	684		684	
	97,000 B.t.u./hr. & over				
	Total	**16,238**	....	**16,238**	**+118**
OTHER THAN SELF-CONTAINED (6)	Under 27,000 B.t.u./hr.	1,363		1,363	
	27,000-32,999 B.t.u./hr.				
	33,000-41,999 B.t.u./hr.	3,016		3,016	
	42,000-53,999 B.t.u./hr.	4,020		4,020	+ 92
No. of Companies	54,000-64,999 B.t.u./hr.				
1959 — 16	65,000-96,999 B.t.u./hr.	1,197		1,197	
1958 — 5	97,000 B.t.u./hr. & over				
	Total	**9,596**	....	**9,596**	**+ 92**
	SPLIT SYSTEMS				
AIR CONDITIONING CONDENSING UNITS (7)	Under 27,000 B.t.u./hr.	14,525	22	14,547	+107
	27,000-32,999 B.t.u./hr.	13,548	205	13,753	+ 54
	33,000-41,999 B.t.u./hr.	45,142	246	45,388	+ 72
	42,000-53,999 B.t.u./hr.	16,502	238	16,740	+116
	54,000-64,999 B.t.u./hr.	21,783	393	22,176	+ 64
No. of Companies	65,000-96,999 B.t.u./hr.	9,187	153	9,340	+ 50
1959 — 55	97,000-134,999 B.t.u./hr.	3,486	84	3,570	
1958 — 36	135,000-184,999 B.t.u./hr.	518	44	562	+170
	185,000 B.t.u./hr. & over				
	Total	**124,691**	**1,385**	**126,076**	**+ 76**
AIR CONDITIONING COILS WITH BLOWER (8)	Under 27,000 B.t.u./hr.			1,087	+ 43
	27,000-32,999 B.t.u./hr.			649	
	33,000-41,999 B.t.u./hr.			5,370	+ 77
	42,000-53,999 B.t.u./hr.			3,996	
	54,000-64,999 B.t.u./hr.			7,673	+ 56
No. of Companies	65,000-96,999 B.t.u./hr.			5,552	+ 67
	97,000-134,999 B.t.u./hr.			3,694	
1959 — 40	135,000-184,999 B.t.u./hr.			478	+329
1958 — 26	185,000 B.t.u./hr. & over				
	Total			**28,499**	**+ 82**
AIR CONDITIONING COILS WITHOUT BLOWER (9)	Under 27,000 B.t.u./hr.			9,014	+ 38
	27,000-32,999 B.t.u./hr.			6,776	+107
	33,000-41,999 B.t.u./hr.			33,592	+ 96
	42,000-53,999 B.t.u./hr.			12,980	
	54,000-64,999 B.t.u./hr.			13,814	+ 58
	65,000-96,999 B.t.u./hr.				
No. of Companies	97,000-134,999 B.t.u./hr.			5,883	+ 51
1959 — 45	135,000-184,999 B.t.u./hr.				
1958 — 26	185,000 B.t.u./hr. & over			....	
	Total			**82,059**	**+ 78**
Grand Total (excluding coils)		**190,358**	**44,086**	**234,444**	**+ 47**

1960 May Set All-Time Sales Record--

(Concluded from Page 1, Column 5)

the industry would probably settle for a 15 to 20% gain in 1960.

The increase in sale of heat pumps is a factor in the sale of central residential and package commercial systems, in which heat pump units must be included. It is estimated that more than 40,000 heat pumps were installed in 1959, as compared with 20,000-25,000 in 1958. Heat pump sales might easily go up 50% in 1960.

BIG SYSTEMS: Installed value of big systems was estimated to have increased 10% in 1959, which would put the total at more than $600 million for this category of equipment. Sales of big systems have increased at a rather steady rate since 1954, when the total annual sales were estimated at $380 million. No spectacular gain in 1960 perhaps, but another increase of 10 to 15% seems a safe prediction.

AUTOMOTIVE: Automobile air conditioner sales seem destined for a new high in 1960. Sales for 1959 seem likely to total from 500,000 to 550,000 units, with independent producers and automobile makers sharing equally in the healthy sales increase.

With 1960 automobile sales forecasted to be on the increase, it seems entirely possible that 650,000 to 700,000 automobile air conditioning units will be sold in 1960.

HEATING: Sales of home heating sales might drop slightly in 1960, mainly because of anticipated lag in housing starts. The U.S. Dept. of Commerce predicts that shipments of gravity and forced warm air furnaces in 1960 may hit 1,347,000 units, compared to the 1,414,269 shipped in 1959.

However, many manufacturers feel that modernization is accounting for a greater portion of their over-all sales than they had realized so that a drop in heating sales may not necessarily follow the same curve as a drop in housing starts. Manufacturers of hydronics systems, claiming a 15% increase in 1959, are looking for further gains in 1960.

COMMERCIAL REFRIGERATORS May Rise 5-6%

Sales of commercial refrigerators (display cases, reach-ins, and walk-ins) on the basis of preliminary reports apparently set an all-time high in 1959, with the increase of around 12% over 1958 pushing the totals past the best previous year of 1955. This would mean that unitary sales of such items pushed past the 175,000 mark.

For 1960, the major industry producers foresee another increase, although the gain may not be as spectacular as that shown in 1959. The feeling is that the increase may be in the area of 5 to 6%.

In other commercial refrigeration items, water coolers had a strong year, reports indicating sales up 30% over 1958, which would put the total near 150,000. Automatic ice makers were apparently on about an even keel, which means that sales were probably in the area of 35,000 units. Refrigerated venders came back from a bad slump in '58 to probably hit 80,000 units, and there are indications that a good increase may be realized in 1960. Bulk tank milk cooler sales were leveling off some, but another good year is expected in 1960.

CONSTRUCTION ACTIVITY May Rise 2%

CONSTRUCTION ACTIVITY IN 1960 is expected to increase 2% over-all. However, residential construction estimates are that 1960 will find only 1,200,000 starts, a decline of 100,000 from the total achieved during 1959. Since the drop is forecast because of the current tight money situation, chances are that the drop in value of residential construction will not be as severe, since more starts will be in the higher price brackets. Another possibility is that more public funds for FHA and VA mortgages might allow 1960 starts to come closer to the 1959 achievement.

Non-residential construction particularly in the commercial and industrial building categories should be up substantially, with industrial construction slated for a $500 million increase over 1959. Religious building construction should exceed the billion dollar mark, and public construction should reach $16.5 billion compared with $16.2 billion in 1959.

ARI Sees Record Breaking Decade--

(Concluded from Page 1, Col. 2)

are not yet reported and tabulated, the growth trend already shown is enough to convince industry observers that 1959 sales of all products in our field will run as much as 20% ahead of 1958, and 10 to 15% ahead of the best previous year—1956.

Compressors about 40% Ahead of '58

"Manufacturers' shipments of compressors, the heart of any mechanical refrigeration or air conditioning system, and thus always a good indicator of industry activity, were running about 40% ahead of 1958 for the first three quarters of the year. However, we are not forecasting that sales of all end products will reflect the gain to this degree, since manufacturers order these components months ahead of actual production and sale of consumer goods.

"At the same time, sales of unitary air conditioners probably will show almost this large a gain over 1958, based on figures for the first nine months of the year, and a total shipment figure of 320,000 units is being estimated, compared with 231,000 in 1958."

"Unitary" equipment, Jones explained, includes all central residential installations, and many smaller commercial and industrial ("packaged") applications. Central residential installations have, over the years, accounted for more than 60% of unitary sales, so, following out the trend, the institute estimates that some 200,000 U. S. homes have been centrally air conditioned this year. This is more than double the home installations in 1954, five short years ago.

Heat Pumps May Hit 40,000 Units in '59

Gains made by the heat pump are even greater than those indicated for unitary cooling equipment over-all, said the ARI managing director. Preliminary figures show that almost 40,000 unitary heat pumps will be shipped by manufacturers in 1959, compared with about 25,000 in 1958, and fewer than 2,000 in 1954.

Aside from central residential air conditioning, in which perhaps the most spectacular gains for 1959 will be shown when the final figures are in, the installation of big "systems" for the cooling of office buildings, apartments and hotels, industrial plants, and similar large structures has continued its upward trend in 1959, although perhaps not so sharply as in the smaller units.

Early estimates are that installed value of such systems in 1959 will be more than $600 million, a gain of about 10% from the figure of $550 million in 1958, and almost 60% over the five-years-ago (1954) installed value of $379 million. These figures represent "equipment in place," rather than the value of manufacturers' shipments, and include cost of installations, ductwork, grilles, and other elements that go to make up the system.

Auto Cooling Growing By Leaps and Bounds

Another area in which air conditioning is gaining by leaps and bounds is the automobile-cooling field, Jones stated. The Society of Automotive Engineers has estimated that by 1962 one in nine cars will be air conditioned, and 25% of all cars produced within five years will be factory-equipped with air conditioning.

Commercial, Industrial Refrigeration May Improve

In the field of commercial and industrial refrigeration, the longer-established phase of mechanical cooling, 1959 has been an excellent year for most of the many products covered in this broad category, and forecasts of increased marketing facilities for foods (75% of which are mechanically cooled at some point along the pipeline from producer and processor to consumer), as well as building outlook and developments in scientific and defense applications, auger well for a further step-up in utilization of refrigerating equipment, it was stated.

Typical of the forecasts that lead manufacturers of refrigeration equipment to look to the future with optimism is the outlook for the frozen food industry, as expressed by Harold J. Humphrey, president of the National Association of Frozen Food Packers, in a talk at the Atlantic City meeting of ARI.

Citing the growth of frozen foods as a factor in American life, Humphrey predicted that "in the next three to four years, total frozen food production should be between 8.5 and 9 billion (b) pounds, an increase of 1.5 to 2 billion pounds" over production this year. . . . "I think you can see the pressing need for adequate refrigeration." This new equipment will be needed, he pointed out, "particularly for trucks, backroom storage in retail stores, retail caibnets, and, of course, home refrigeration."

Military Use Growing

Military uses for specialized cooling equipment have shown a great growth over the past four or five years, and as highly-developed electronic processes, weapons systems, test facilities, supersonic aircraft, and nuclear-propelled water craft become an ever greater part of the nation's defense equipment, the essentiality of mechanical refrigeration to their production and operation will become more apparent—and vital.

—AIR CONDITIONING— MANUFACTURERS

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Surplus Show To Offer Cooling, Heating Items

NEW YORK CITY—Air conditioning, refrigeration, plumbing, and heating equipment will be offered for sale at the 10th annual trade show and convention of the Institute of Surplus Dealers to be held Jan. 24-26 in the New York Trade Show building, 8th Ave. and 35th St.

Surplus merchandise originally manufactured for the U. S. Army and Navy and for other branches of the government, as well as excess stocks of private industry, will be represented among the exhibits.

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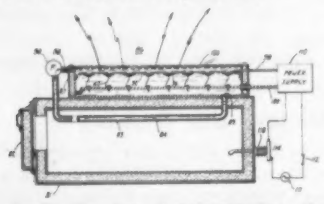
DIVISION OF HAGAN
CHEMICALS & CONTROLS, INC.

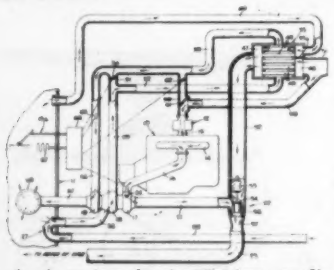
PATENTS *Week of August 11*

2,898,743. ELECTRONIC COOLING DEVICE AND METHOD FOR THE FABRICATION THEREOF. William E. Bradley, New Hope, Pa., assignor to Philco Corp., Philadelphia, Pa.



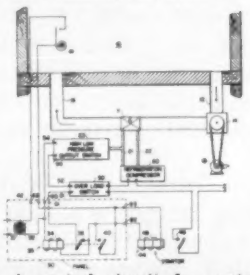
1. In the art of refrigeration, the method which comprises cooling a heat load by maintaining said heat load in intimate heat-exchange relation with a semiconductive element containing a minority-carrier emissive potential barrier and also containing a region of radiative-recombination material adjacent said barrier, and passing a current across said barrier in the forward direction to inject minority-carriers into said region thereby to produce characteristic electromagnetic radiation from said body, said current having a value lying in a range between a lower limit greater than zero and an upper limit for which the heating effect of said current due to the resistance of said body becomes as great as the cooling effect exerted by said current.

2,898,745. AUTOMOBILE AIR CONDITIONING AND SUPERCHARGING SYSTEM. Zenas V. Weisel, Los Angeles, Calif.



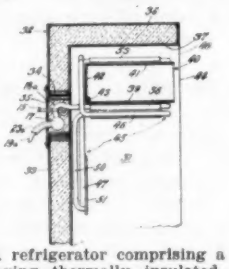
1. A system for temperature conditioning and ventilating a compartment in a self-propelled road vehicle having an internal combustion engine, said system comprising an exhaust gas turbine, a heat exchanger having independent passages, means to conduct exhaust gases from said engine to the inlet of said turbine, means responsive to the flow of exhaust gases from said engine to produce a flow of atmospheric cooling air through one passage of said heat exchanger. . . .

2,898,746. CONTROL MEANS FOR REFRIGERATION COMPRESSOR. John W. Mobarry, Edina, Minn., assignor to Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.



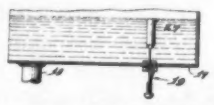
1. A control circuit for controlling the operation of an electric motor driving a refrigeration compressor in an air conditioning installation, a source of power, first relay means having an energization winding and two associated switches controlled thereby, a first of said switches being closed when said winding is energized and a second of said switches being opened when said winding is energized, second relay means having an energization winding and a switch controlled thereby, said last mentioned switch being closed when said energization winding of said second relay is energized. . . .

2,898,748. REFRIGERATOR EMPLOYING SECONDARY REFRIGERATION SYSTEM. Hugo Malcolm Ullstrand, Stockholm, Sweden, assignor to Aktiebolaget Elektrolux, Stockholm, Sweden.



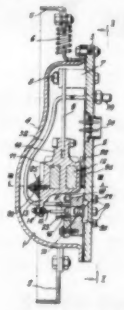
1. A refrigerator comprising a cabinet having thermally insulated walls defininig a storage compartment having a front access opening, one of said walls having an opening and a thermally insulated closure therefor, refrigeration apparatus including a cooling element disposed in said storage compartment and removable therefrom through said wall opening, structure providing a freezing section in the upper part of said compartment, said cooling element being arranged to effect cooling of said freezing section. . . .

2,898,931. VACUUM BREAKER. Gilbert P. Carlson, Skokie, Ill., assignor to Bell & Gossett Co., Morton Grove, Ill.



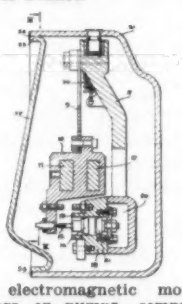
1. A vacuum breaker for facilitating drainage of a tank forming part of a closed, normally pressurized, liquid system having a normally closed drain opening below the tank and comprising a member adapted for detachable mounting outside of and in closing relation to a bottom opening in the bottom of the tank and connected through such bottom opening to a float within the tank, the detachment of the member providing through the bottom opening communication between the atmosphere and the tank and the increasing distance of the member from the tank as the float drops when the drain is open providing a visual indicator of the drainage from the tank.

2,899,124. ELECTRO-MAGNETICALLY MAINTAINED OSCILLATING MOVEMENT HERMETIC COMPRESSOR. Andre Chausson, Asnieres, France, assignor to Societe Anonyme des Usines Chausson, Asnieres, France, a company of France.



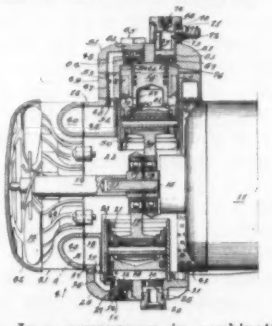
1. An electromagnetic motor for a compressor having a movable compressor element, comprising a support for the compressor and formed of magnetic material, a pair of electromagnets in spaced relation on said support and in magnetic relation therewith, a flexible blade on said support, and an armature magnet carried by said blade for connection with the movable compressor element, said armature magnet being insulated from said support and disposed between said electromagnets to complete a magnetic circuit through said support and be vibrated upon energization of said electromagnets with alternating current to drive the movable compressor element.

2,899,125. ELECTROMAGNETICALLY MAINTAINED OSCILLATING MOVEMENT HERMETIC COMPRESSOR. Andre Chausson, Asnieres, France, assignor to Societe Anonyme des Usines, Chausson, Asnieres, France, a company of France.



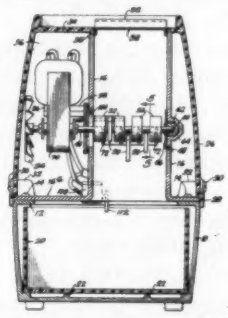
1. An electromagnetic motor for compressors or pumps, comprising a magnetic circuit provided with two symmetrical elements oppositely disposed in spaced relationship, each one of said symmetrical elements having three parallelly disposed and magnetically connected poles respectively provided with at least one alternating current winding, a reciprocable armature having two permanent magnets of opposite polarity inserted between the poles of said two symmetrical elements, a flexible member carrying said armature, and a bearing plate carrying said magnetic circuit and flexible member.

2,899,130. COMPRESSOR. Robert E. Sykes, Evanston, Ill., assignor to Bell & Gossett Co., Morton Grove, Ill.



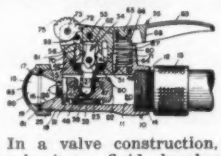
1. In a compressor, in combination: casing means forming a compressor body having the general shape of an annulus to provide an axial air space, said body including radially spaced inner and outer exterior peripheral walls defining a pulsation chamber that is isolated from and extends about the periphery of said space, said body having a pocket opening radially therethrough, a fluid-compression assembly in said pocket and including a cylinder and head therefor carried by said body, a piston reciprocable in the cylinder, and means in said space for actuating said piston, means of communication between said cylinder and said chamber, and means for flowing a stream of air over and in heat-exchange relation with said walls.

2,899,140. ICE CRUSHER DIRECTLY DRIVEN BY ELECTRIC MOTOR. John T. Hellyer, Wayne, Ill., assignor of one-half to Robert S. Strom, Wheaton, Ill.



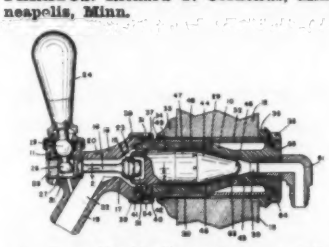
A material crusher comprising a tubular duct open at opposite ends, ice crushing means disposed in said duct, intermediate its ends, and comprising a shaft journaled at one end in one wall of said duct and the opposite portion extending through an enlarged opening in the opposite wall of said duct, material crushing elements mounted on said shaft, shear blades carried on the interior of the duct and positioned in cooperating relation to said crushing elements. . . .

2,899,169. VALVE STRUCTURE. Karl A. Klingler, Naperville, Ill.



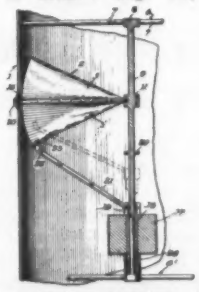
1. In a valve construction, a valve casing having a fluid chamber therein, a discharge port in communication with said chamber, a valve body composed of resilient material slidably disposed within said chamber and yieldable to compensate for variations in its size and in the size tolerance of parts associated therewith, means for supporting the valve body in axial alignment with said port and spaced from the casing to permit passage of fluid between the valve and said casing. . . .

2,899,170. LIQUID DISPENSING APPARATUS. Richard T. Cornelius, Minneapolis, Minn.



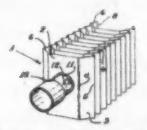
1. In a liquid dispensing apparatus comprising a body having a tapered bore, a core disposed in said body and having a tapered portion received in said more and forming a restricted passageway therebetween, means for reciprocating said core within said bore, a detachable faucet having a passageway therethrough communicating with said bore. . . .

2,899,171. DAMPER CONSTRUCTION. Clyde S. Simpelaar, Racine, Wis., assignor to Modine Mfg. Co., Racine, Wis.



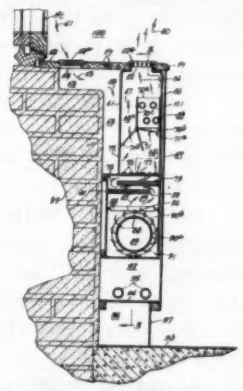
5. In a damper structure, the combination of a plurality of damper elements, each comprising four walls pivotally connected one to the other along their adjacent edges, the pivotal axes thereof extending in converging directions, a duct member, said damper elements being assembled in co-operable relation radially disposed within the duct member about the axis of the duct member with their pivotal axes extending towards said axis of the duct member, means for supporting said damper elements within the duct member for movement of the walls with their respective pivotal axes. . . .

2,899,178. HEAT EXCHANGE FINS AND ASSEMBLY. Melvin Dubin and Isidore Turinsky, Brooklyn, N. Y., assignors to Slant-Fin Corp., Richmond Hill, N. Y.



1. A heat exchange fin formed of light weight sheet metal material which comprises, a main portion and side portions extending from a pair of the opposite sides of said main portion, said side portions extending rearwardly and inwardly from and with respect to said main portion, said side portions each being formed of a plurality of flat strips extending at abrupt angles with respect to each other and to said main portion. . . .

2,899,180. HIGH-VELOCITY AIR-CONDITIONING. Claes Allander, Jonkoping, Per-Olof Alfredsson, Bromma, and Sven Wallin, Jonkoping, Sweden, assignors to Aktiebolaget Svenska Flaktfabriken, Stockholm, Sweden.



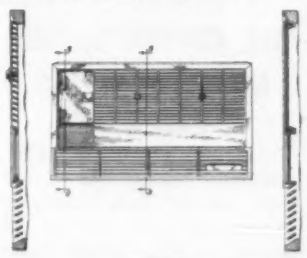
1. For air conditioning a room having a window, a conditioning unit adapted to be mounted below said window comprising a casing, a partition dividing the upper part of said casing into two channels, the first of said channels disposed adjacent said window and the second of said channels disposed outwardly of said window, a secondary air inlet in the top of said unit opening into said first channel, an air outlet in the top of said unit opening into said second channel, said secondary air inlet disposed intermediate said outlet and said window. . . .

2,899,256. REFRIGERATING APPARATUS. Curtis P. Kelley, Dayton, Ohio, assignor to General Motors Corp., Detroit, Mich.

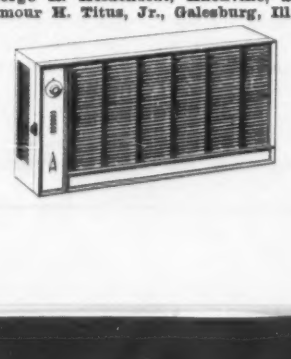
In a refrigerator, a cabinet having an access opening, a door for closing said opening, means for sealing the said opening, means for sealing the junction between said door and said cabinet, said means including interlocking portions carried by said cabinet and said door respectively, one of said interlocking portions comprising an elastomeric element having a longitudinally extending groove which is narrowest at its inlet and the other of said portions comprising an elastomeric element having a longitudinally extending groove. . . .

DESIGNS

185,886. FRONT GRILLE FOR ROOM AIR CONDITIONER. Philip S. Egan, Glenview, Ill., assignor to Sears, Roebuck & Co., Chicago, Ill.



185,887. ROOM AIR CONDITIONER. George R. Heidenblut, Knoxville, and Armour H. Titus, Jr., Galesburg, Ill.



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POSITIONS WANTED

OVERSEAS EMPLOYMENT wanted. Broad experience and training in installation, sales, engineering, and administration in air conditioning, refrigeration, and related mechanical construction. Six years overseas including military construction. Interested in responsible job with manufacturer, dealer, or on major construction project. FENTON DANCY, 1702 Council Bluff Drive, Atlanta, Georgia.

VERSATILE MAN with 18 years of air conditioning experience wishes to relocate. Diversified experience in design, service, and production of equipment ranging from ½ to 100 tons. Complete resume upon request. Write BOX A6426, Air Conditioning, Heating & Refrigeration News.

POSITIONS AVAILABLE

REFRIGERATION AND air-conditioning service mechanics with five years' experience in super-market field are needed to service "Acme Super Markets" in Long Island and North Jersey. Send resume to: W. COLSON, 185 Washington Street, Newark 1, New Jersey.

AIR CONDITIONING and refrigeration service engineer to locate in Southeast. Write and give experience on controls, control wiring, air distribution and general knowledge of air conditioning and refrigeration equipment and systems. Send qualifications to H. L. MALONEY, P. O. Box 13005, Station K, Atlanta 24, Georgia.

REFRIGERATION ENGINEER to assume complete charge of the design and development of residential refrigerators wanted by West Coast manufacturer. State age, past experience, education and salary requirements. Our engineers know of this ad. Reply to: BOX A6415, Air Conditioning, Heating & Refrigeration News.

MANUFACTURER'S REPRESENTATIVE for commercial refrigerator manufacturer. Several desirable territories open, including New England states; Mo.-Kansas; Texas-Oklahoma; Calif.-Arizona. Prefer man with experience selling refrigeration dealers; chains and wholesale grocers, or experienced commercial refrigeration dealer desiring to be field representative for a manufacturer. Give details as to experience; territory you can cover; also industry references. Replies held in confidence until interview. BOX A6423, Air Conditioning, Heating & Refrigeration News.

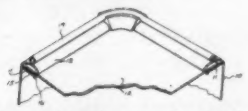
AIR CONDITIONING Eastern manufacturer has immediate opening for two (2) product sales managers of (1) Packaged liquid chillers through 125 h.p., Freon and Ammonia compressors above 10 h.p.; (2) large central station and multi-zone conditioners and blast coils. Responses will be handled confidentially. Send resume of experience, training and salary desired to BOX A6424, Air Conditioning, Heating & Refrigeration News.

HELP WANTED—Manufacturer's representative to handle going line of ice machines in Ohio, Indiana, Kentucky, and Michigan for large, long established manufacturer of quality products. Excellent opportunity. Reply to BOX A6425, Air Conditioning, Heating & Refrigeration News.

PATENTS

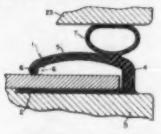
Week of August 18

2,899,720. GASKET. Earl C. Vollmer, Rock Island, Ill., assignor to Midwest Mfg. Co., Galesburg, Ill.



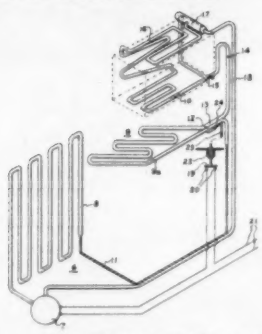
5. In combination, an elongated gasket comprising a base and a resilient distortable outer member connected to said base and disposed outward therefrom, said gasket extending around a corner and at said corner having its base removed to provide a cutaway portion disposed between adjacent segments of the base which are located at the opposite sides of said corner, said outer member of the gasket being continuous across said cutaway portion at the corner. . . .

2,899,721. REFRIGERATOR DOOR SEAL. Eugene T. Herman, St. Marys, Ohio, assignor to The Goodyear Tire & Rubber Co., Akron, Ohio.



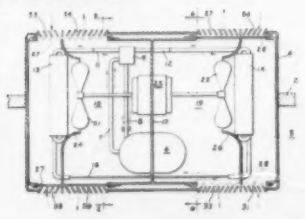
1. A gasket for a refrigerator door adapted to be secured around the periphery of the door to provide a seal between the door and the refrigerator, said gasket comprising a strip of resilient material of similar cross-sectional shape throughout its length, said cross-section including a base to position and secure said strip on a door, a convexly arched, cantilever member attached only at one end to said base whereby the other end thereof is free to move laterally with respect to said base and a door to which the gasket is secured. . . .

2,899,801. AUTOMATIC DEFROSTING EVAPORATOR ARRANGEMENT. Charles S. Grimshaw, Fulton, Ill., assignor to General Electric Co.



1. A refrigerator comprising a cabinet including a freezer compartment, an evaporator disposed in each of said compartments, a condensing unit, means connecting said unit and evaporators in closed series connection and including an inlet tube connected to the evaporator in said cold storage compartment for supplying refrigerant to said evaporator. . . .

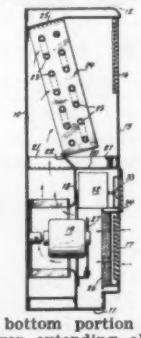
2,899,802. ROOM AIR CONDITIONING APPARATUS HAVING AUTOMATIC ODOR REMOVAL OPERATION. Stephen L. McMillan, Jeffersontown, Ky., assignor to General Electric Co.



1. In an air conditioning apparatus for conditioning the air within an enclosure, the combination comprising a refrigeration system including a compressor and a pair of heat exchangers interconnected in refrigerant flow relationship, at least one of said heat exchangers capable of being refrigerated by the flow of refrigerant therethrough, air moving means in said apparatus for circulating separate streams of air over each of said heat exchangers. . . .

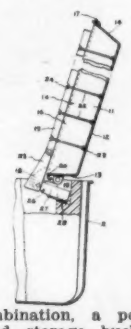
2,899,803. AIR CONDITIONING APPARATUS. Albert A. Paley, Kew Gardens, N. Y.

1. An air-conditioning device comprising an upright box-like casing having extensive, parallel front and rear walls, said casing being relatively shallow from front to rear and including tall and narrow side walls extending between and joining the said front and rear walls, said front casing wall having an air intake louver extending



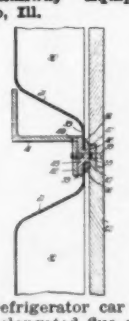
along its bottom portion and an air outlet louver extending along its top portion, said louvers being vertically spaced from each other. . . .

2,899,804. ICE EJECTING AND STORAGE MEANS. Arthur W. Carew, Louisville, Ky., assignor to General Electric Co.



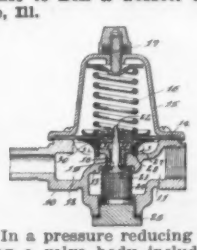
1. In combination, a portable ice receiving and storage bucket and a freezing tray of the type comprising an elongated tray and a grid structure secured in said tray for limited movement relative thereto, said grid structure including a plurality of transverse dividers dividing said tray into a plurality of sections and arranged for tilting movement relative to said tray to loosen ice blocks frozen in said sections, means for tilting said inclined dividers relative to said tray. . . .

2,899,913. WALL STRUCTURE FOR REFRIGERATOR CARS. Kurt E. Zeidler, Chicago, Ill., assignor to Standard Railway Equipment Mfg. Co., Chicago, Ill.



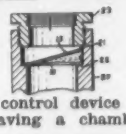
1. In a refrigerator car having vertical posts, elongated flue sheet fasteners trapezoidal in cross section removably attached to said posts and coextensive therewith, a groove along each longitudinal edge of said fasteners, flue sheets compressed between said fasteners, said flue sheets having a body portion with vertical side marginal edges held within said grooves by the resilience of said sheets, and lining secured to said flue sheet fasteners, whereby said lining, said fasteners and said flue sheets form enclosed vertical flues.

2,899,973. PRESSURE REDUCING VALVE. Gilbert F. Carlson, Skokie, Ill., assignor to Bell & Gossett Co., Morton Grove, Ill.



2. In a pressure reducing valve comprising a valve body including an inlet and an outlet separated by a wall within the body and passage means in the wall for connecting the inlet and outlet, a valve member for controlling flow through the passage means from the inlet to the outlet, a diaphragm connected to the valve member and responsive to pressure in the outlet for shifting the valve member to closed position. . . .

2,899,981. FLOW CONTROL DEVICE. Chester J. Binks, La Grange, Ill., assignor to Scovill Mfg. Co., Waterbury, Conn.

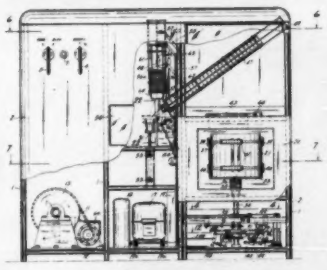


1. A flow control device comprising a conduit having a chamber therein with an outer annular shoulder facing the upstream side thereof, a metal disc extending across said chamber and seated against said shoulder, said disc having a resilient tongue which extends lengthwise substantially more than half-way across the disc and integrally joined to the disc at one end. . . .

Editor's Note: Patents described here have been selected from the "Official Gazette" of the United States Patent Office. They offer only a brief summary of each invention. In some instances only the first part of the digest is presented.

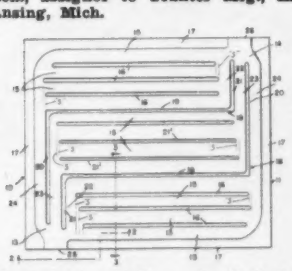
Printed copies of patents, reissued patents, and patent designs may be secured from the Patent Office; patents and reissues are 25¢ each, while designs are furnished at 10¢ each. Address orders to: Commissioner of Patents, Washington 25, D. C.

2,899,968. ICE CREAM DISPENSER. Dale L. Stanley, West Allis, Wis.



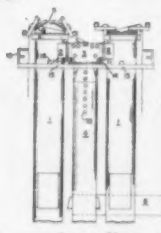
1. In an ice cream dispenser, a scoop, means for moving said scoop downwardly into a circular ice cream container, means for moving said scoop radially with said container, means for withdrawing the scoop therefrom, means for rotary indexing movement of the container, and means for retaining said scoop at different levels in said container during such action, whereby successive layers of ice cream may be removed from the container.

2,900,175. PLATE HEAT EXCHANGE UNIT. Orton S. McGuffey, Lansing, Mich., assignor to Tranter Mfg., Inc., Lansing, Mich.



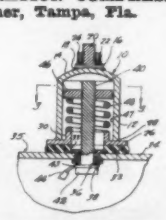
7. A heat transfer unit adapted to internally circulate a fluid heat transfer medium under substantial pressure, comprising a pair of plates marginally secured together in face to face relation, at least one of which is provided with concave formations facing the other to afford fluid intake and discharge headers between the secured plates and longitudinal circulatory passages communicating therewith. . . .

2,900,130. CUPOLA GAS RECEIVING AND COOLING SYSTEMS. Raymond C. Ortgies, Louisville, Ky., assignor to American Air Filter Co., Inc., Louisville, Ky.



1. A cupola-cooling tower system comprising: a first cupola having a lateral hot gas outlet near its top; an adjacent cooling tower having an inlet for said hot gas and an outlet for the cooled gas; and gas passage providing means connecting said cupola outlet to said tower inlet, said connecting means including a tubular fitting having a gas inlet end containing a gas inlet opening positioned to receive hot gas from said lateral outlet. . . .

2,900,438. SPRING LOADED TERMINAL SEAL FOR SEALED REFRIGERATION COMPRESSORS. Paul J. Hirtner, Tampa, Fla.



1. A terminal seal for a refrigeration unit having an externally projecting terminal post constituting a connection between external and internal lead wires of said unit, comprising: an electrically conductive shell proportioned to enclose said post, said shell including an end wall at one end thereof; electrically conductive means on said end wall for connecting said external lead wire to the shell, the shell having a cavity the wall of which is of non-circular cross section. . . .

Slant/Fin Names Steiner Assistant Sales Manager

RICHMOND HILL, N. Y.— Melvin Dubin, president of Slant/Fin Radiator Corp., announced the appointment of Herb Steiner as assistant sales manager.

Steiner had been covering sections of Long Island and Connecticut for Slant/Fin. In addition to assisting Sales Manager Al Buschel, he will be responsible for expanding Slant/Fin's educational clinic and meeting program and will assist the sales force in the field.

Tucker Is Remington Chief Engineer

AUBURN, N. Y. — Carl L. Tucker has been appointed chief engineer of Remington Corp., manufacturer of air conditioning equipment, it was announced by Herbert L. Laube, president.

C. L. Tucker

Tucker joined Remington on Feb. 1, 1959 as project engineer specializing on Remington's "Incremental" type of equipment.

Upon receiving his mechanical engineering degree from Kansas State college in 1943 Tucker joined General Electric Co., where he remained until 1954 except for 17 months during which he was loaned to the Manhattan Project in Oak Ridge, Tenn. In 1954 he joined the air conditioning engineering department of Emerson Radio & Television Corp. as project engineer, which position he held until joining Remington.

Aeroquip Promotes Victor Emery

JACKSON, Mich. — Victor Emery has been promoted to general sales manager of Aeroquip Corp.'s Industrial Div., it was announced by Peter F. Hurst, Aeroquip president.

Emery was formerly manager of manufacturers' sales for the Industrial Div.

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CRMA Surveys Prospects for '60--

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shipments for the first 10 months of this year represented an increase over the same period last year of 12.3%. If the same trend continues through the remaining two months, it was predicted, there should be a slight excess over 1955, the previous peak year.

See No Easing of Labor's Demands

A second panel reported they could find nothing on the horizon to suggest any easing in pressure for further wage rate and fringe benefit concessions. It was pointed out, however, that some labor groups seem to be showing a greater disposition to consider management proposals for increasing productive efficiency, and that a number of contracts have been negotiated in recent months in which provisions of this character were incorporated.

Raw Materials Should Not Rise Immoderately

Prices of raw materials and components should not rise immoderately, in the opinion of a panel that had been assigned the task of reading the industry's "crystal ball" from the viewpoint of operating costs. Since one of the chief benefits of high volume is ability to spread costs over a broader base, it was pointed out, the panel predicted that costs of such items as coils, valves, compressors, etc., should show little if any real change in the foreseeable future. Keen competition among suppliers also was cited as a deterring factor. A rise in steel prices, it was further suggested, would be modified by the growing importations of the metal from Europe and Japan.

Other discussions included a study of financing and credit trends with a prediction that interest rates should continue inching upward due to brisk competition for investment funds, with financing costs rising in proportion. The stability that has characterized down payment and terms policies over the past several years was pointed to as being highly encouraging.

Joint Activities of NCRSA-CRMA Discussed

The group also heard a report on a recent meeting of the NCRSA-CRMA Joint Relations Committee from its chairman, Arthur B. Biddle, executive vice president, Hussmann Refrigeration, Inc. He termed this liaison activity sponsored by the two associations as an important advance in promoting better understanding between the manufacturers and their distributor-customers, and said that much progress had already been made. Biddle strongly urged the manufacturers to encourage their distributors to affiliate with NCRSA, commending that organization for the work it is doing to promote sound business methods in their operations, and to upgrade their activities generally.

After a discussion of the industry's position in reference to the current move to enact regulatory codes for the handling of frozen foods at all levels, the group concluded that it should not "take sides" in the increasingly active controversy between pro-and anti-code interests. Groundwork for the discussion was laid by C. V. Hill, board chairman, C. V. Hill & Co., chairman of CRMA's Frozen Food Equipment Committee, who reported the reactions of his committee to requests from several state health agencies for guidance in drafting such codes.

Explain Neutrality On Frozen Food Code

In arriving at the decision to retain a neutral position, a majority of the members of the group were of the opinion that quality control cannot be achieved through legislation and that existing food and health laws are thoroughly adequate for health protection. They pointed out that the industry has always worked closely with all segments of the food industry toward the improvement of standards for all types of perishable foods, frozen or otherwise, and will continue to do so.

Mark Allen, secretary-treasurer, Weber Showcase & Fixture Co., Los Angeles, who was elected president of the association at the last annual meeting, acted as chairman of the meeting. In his review of CRMA's progress during the year, he emphasized the importance of the recently approved amendment to the national truck freight regulations, which will lower some industry transportation costs materially, and commended CRMA's traffic committee for its persistence and effectiveness. Allen also commented on the group's close attention to mutual problems and the cooperation the individual members have shown in meeting them upon, as he termed it, "a teamwork basis at all time."

Death Notices

Harry R. Clarage

KALAMAZOO, Mich.—Harry R. Clarage, 70, president of the Clarage Fan Co. here since 1945, passed away suddenly on Dec. 26.

He suffered a cerebral hemmorhage while visiting his daughter and son-in-law, Lt. Col. and Mrs. John W. Medusky, at Alexandria, Va.

His father, Charles C. Clarage, pioneered the company's development in 1913 as a fan manufacturer.

Arlie C. Kniseley

BUFFALO — Arlie C. Kniseley, who had been employed by Niagara Blower Co. here as district engineer in Virginia and North Carolina for 18 years, died Dec. 19 in Richmond, Va. He had been in ill health for some months.

Kelvinator Policy--

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